JOB NO.: TCS00491/09

DSD CONTRACT NO.: DC/2009/08

CONSTRUCTION OF YUEN LONG SOUTH BRANCH SEWERS AND EXPANSION OF HA TSUEN SEWAGE PUMPING STATION

10th QUARTERLY ENVIRONMENTAL MONITORING & AUDIT SUMMARY REPORT – (May to July 2012)

PREPARED FOR

CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) COMPANY LIMITED

Quality Index

Date	Reference No.	Prepared By	Certified By
22 August 2012	TCS00491/09/600/R0395v3		
		Nicola Hon (Environmental Consultant)	T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	14 August 2012	First submission
2	20 August 2012	Amended against IEC's comments on 17 August 2012
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22 August 2012

By Email

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Your Ref:

Our Ref: EB000586-F/THW12-8259

For attention of: Mr. T. W. Tam

Dear Mr. Tam,

Contract No.: DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station
Quarterly EM&A Summary Report for Designated Project (May to July 2012) – IEC Verification

With reference to ET's captioned report (ET's ref.: TCS00491/09/600/R0395v3, dated 22 August 2012), we have no comment and hereby verify the captioned report excluding the Landscape and Visual Impact section of the report.

We request the ET to submit the separate submission of Landscape and Visual Impact section of the report as soon as possible, for the completion of the captioned report.

Should there be any queries, please feel free to contact the undersigned on 2911 2744.

Yours sincerely,

F.C. TSANG
Independent Environmental Checker
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EXECUTIVE SUMMARY

ES.01. This is the **10th** Quarterly EM&A Summary Report for the *Expansion of Ha Tsuen Sewage Pumping Station* under Environmental Permit No.EP-327/2009/A (hereinafter ''the EP''), covering the period from **1 May to 31 July 2012** (hereinafter "Reporting Period").

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Aspects	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	**96**
	24-hour TSP	**31**
Construction Noise	$L_{eq(30min)}$ Daytime	**32**
Water Quality	Dissolved Oxygen	**39**
	Turbidity	**39**
	Suspended Solids (SS)	**39**
Inspection / Audit	ET Weekly Environmental Site Inspection	**14**

BREACHES OF ACTION/LIMIT LEVELS

ES.03. In the Reporting Period, monitoring results demonstrated that no exceedance of environmental quality criteria recorded in both air quality and construction noise. However, a total of six (6) Limit Level exceedances namely 3 in turbidity and 3 in SS were recorded for water quality monitoring. Breaches of the exceedance are summarized in the following table.

Environmental Aspects	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	Dissolved Oxygen	0	0	0	--	--
	Turbidity	0	**3**	**3**	Not project related	n.a.
	Suspended Solids	0	**3**	**3**	Not project related	n.a.

ES.04. For the water quality exceedances, notification of exceedance (NOE) was issued to relevant parties upon confirmation of the results. Investigation for the cause of exceedance has been carried out and concluded that the exceedances were not related to the works under the DP Project. No corrective action was therefore required.

ES.05. The results and findings for landscape and visual monitoring, as part of the EM&A programme, will be submitted in a stand-alone submission.

ENVIRONMENTAL COMPLAINT, NOTIFICATIONS OF SUMMONS AND PROSECUTIONS

ES.06. No documented complaint, notifications of summons and successful prosecutions were received during the Reporting Period. No associated mitigation action is needed.

REPORTING CHANGES

ES.07. There are no reporting changes in this reporting month.

FUTURE KEY ISSUES

ES.08. During wet season, muddy water or other water pollutants from site surface runoff into the local stream will be key environment issue. Therefore, water quality mitigation measures to prevent surface runoff into nearby water bodies should be paid on special attention. Moreover,

mitigation measures should be properly maintained to avoid fugitive dust emissions from loose soil surface or haul road.

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1 INTRODUCTION

BACKGROUND

1.01 The China State Construction Engineering (Hong Kong) Limited (hereinafter "CSCE") has been awarded by the Drainage Services Department (DSD) the Contract DC/2009/08 *Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station* (the Project) in October 2009.

1.02 The Project involves construction of about 9km of sewers and rising mains with diameter ranging from 200-1500mm in Yuen Long South and Ha Tsuen areas, a sewage pumping station near Shui Tsiu San Tsuen Road in Yuen Long South, expansion of existing Ha Tsuen Sewage Pumping Station. The site layout plan is shown in ***Appendix A***.

1.03 The expansion of Ha Tsuen Pumping Station is under a statutory EIA (Register No. AEIAR-072/2003) study for "*Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station*" commissioned by the DSD. The Variation Environmental Permit No. EP-327/2009A for upgrading and expansion of Sewage Treatment Works at San Wai (excluded for the Project) and Ha Tsuen Sewage Pumping Station was again obtained by DSD in June 2010 for the relevant works.

1.04 According to Section 25 of the Particular Specification (PS) and the Variation Environmental Permit No. EP-327/2009A, the scope of monitoring includes air quality, construction noise, water quality and environmental site audit. It should be undertaken in accordance with the Environmental Monitoring and Audit Manual as part of EIA report [AEIAR-072/2003] (hereafter "the EM&A Manual") by an independent Environmental Team (ET).

1.05 This is the **10th** Quarterly EM&A Summary Report which is part of the EM&A programme under Environmental Permit No. EP-327/2009/A for the Expansion of Ha Tsuen Sewage Pumping Station, covering the period from **1 May to 31 July 2012**.

REPORT STRUCTURE

1.06 This Report is structured as follows:

Section 1 Introduction
Section 2 Project Organization and Construction Progress
Section 3 Summary of Impact Monitoring Requirements
Section 4 Monitoring Results and Breaches of Environmental Quality Criteria
Section 5 Waste Management
Section 6 Site Inspections
Section 7 Non-compliance, Complaints, Notifications of Summons and Successful Prosecutions
Section 8 Implementation Status of Mitigation Measures
Section 9 Conclusions and Recommendations

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.01 Organization structure and contact details of the Contractor and relevant parties with respect to the on-site environmental management are shown in ***Appendix B***.

WORKS UNDERTAKEN DURING THE REPORTING PERIOD

2.02 The tentative master construction program is enclosed in ***Appendix C.*** Also, the major construction activities undertaken in this reporting period are listed below:

May 2012 • Construction of pumping station
June 2012 • Construction of pumping station
July 2012 • Construction of pumping station

SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in the Reporting Period is presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Environmental Permit (EP-329/2009/A)	Update on 1 June 2010
2	Chemical waste Producer Registration Registration No. 5213-511-C3570-01	Issued on 13 Nov 2009
3	Water Pollution Control Ordinance (Discharge License) License No. WT00005671-2009	Issued on 12 Jan 2010 Expiry date: 31 Jan 2015
4	Billing Account for Disposal of Construction Waste (Account Number: 700947)	Issued on 7 October 2009

2.04 The baseline monitoring report - *Expansion of Ha Tsuen Sewage Pumping Station* (*Ref: TCS00491/09/600/R0023v6*) had been verified by IEC and endorsed by EPD.

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

MONITORING PARAMETERS

3.01 According to the *EM&A Manual*, the environmental aspect implemented by ET, including air quality, construction noise and water quality, also the landscape and visual impact to be monitored by a competent landscape architect. The monitoring parameters are summarized in ***Table 3-1***.

Table 3-1 Summary of Monitoring Parameters

Environmental Aspect	Parameters
Air Quality	• 1-hour Total Suspended Particulates (hereinafter '1-hr TSP'); and • 24-hour Total Suspended Particulates (hereinafter '24-hr TSP').
Construction Noise	• A-weighted equivalent continuous sound pressure level (30min) (hereinafter '$L_{eq(30min)}$' during the normal working hours; and • A-weighted equivalent continuous sound pressure level (5min) (hereinafter '$L_{eq(5min)}$' for construction work during the restricted hours.
Water Quality – Local Stream Course	• In Situ Measurement - Dissolved Oxygen (DO) and Turbidity • Laboratory Analysis - Suspended Solids (SS)
Water Quality – Effluent Discharge	• In Situ Measurement - pH value • Laboratory Analysis - SS and Chemical oxygen demand (COD)
Landscape and Visual Resources	• Vegetation survey undertaken on an "area" basis to identify representative types and species composition; • Assessment of landscape character; and • Tree survey report. • The inspection findings will be submitted separately.

MONITORING LOCATIONS

Air Quality

3.02 The designated monitoring location Yeung Chun Pui Care & Attention Home has been identified. As High Volume Sampler (HVS) installation at another designated air monitoring station Tin Shing Court was refused by the incorporated owners, the alternative location Ho Tak Sum Primary School as sensitive receiver mentioned in the EIA Report (Register No. AEIAR-072/2003) is proposed to be the replacement to undertake air quality monitoring in accordance with the EM&A Manual Clauses 2.2.1.20. The proposal and recommendation is agreed by IEC and as endorsed by EPD. Details of monitoring stations are presented in ***Table 3-2*** and illustrated in ***Appendix D***.

3.03 As informed by the Contractor on 19 October 2011, an incident report was received from the Yeung Chun Pui Care & Attention Home (AM2) that the HVS was used by some of the old folks as a stairway to escape from the premise, causing a serious safety problem to the escapees as well as the Home of the Elderly. The person in charge of Yeung Chun Pui Care & Attention Home therefore request prompt removal of the HVS from the premise.

3.04 Therefore, the HVS had been shifted to nearby location less than 10 meters from the original location towards the construction site on 27 October 2011. Since the shifted distance of the monitoring location is less than 10 meters, it is considered that the background condition would not have significant change, the Action Level of 1-hour and 24-hour TSP remain unchanged as the original location and the Location ID is also remained as AM2 - Yeung Chun Pui Care & Attention Home. The relocated monitoring location was accepted by EPD, RE and IEC.

Table 3-2 Air Quality Monitoring Stations

Monitoring Location ID	Identified Address	Remarks
AM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
AM2*	Yeung Chun Pui Care & Attention Home	Designated in the EM&A Manual

** HVS had been shifted to nearby location less than 10 meters from the original location towards the construction site on 27 October 2011.*

Construction Noise

3.05 Similar to the air quality monitoring, the construction noise monitoring stations undertaken for EM&A programme was agreed by IEC and endorsed by EPD. Details of the monitoring stations are presented in ***Table 3-3*** and shown in ***Appendix D***.

Table 3-3 Construction Noise Monitoring Stations

Monitoring Location ID	Identified Address	Remarks
NM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
NM2	Yeung Chun Pui Care & Attention Home	Designated in the EM&A Manual

Water Quality

3.06 One designated location of a local stream course, Tin Shui Wai Nullah, is recommended to carry out water quality monitoring in accordance with the EM&A Manual. The designated sampling location R1 is located at the midpoint between two pedestrian flyovers athwart Tin Shui Wai Nullah, which are 320 meters apart. There are technical difficulty and safety issue to sample at R1. So, a new sampling point located at approximately 160m upstream of the R1 (hereinafter as R1b) was therefore proposed for the local stream water quality impact monitoring and was verified by IEC, without comment from EPD.

3.07 Details of the monitoring station are presented in ***Table 3-4*** and shown in ***Appendix D***.

Table 3-4 Local Stream Water Quality Monitoring Station

Monitoring Location ID	Identified Address	Remarks
R1b	The athwart Tin Shui Wai Nullah pedestrian flyover	About 160 meters upstream from the designated location as stipulated in the EM&A Manual. Also, it is closer to the existing Ha Tsuen Sewage Pumping Station

Landscape and Visual

3.08 The selected route and area, frequency and requirements of landscape & visual monitoring is proposed by a competent landscape architect.

MONITORING FREQUENCY

3.09 The impact monitoring frequency and duration for air quality, construction noise, water quality of local stream course, and landscape & visual are summarized below.

Air Quality Monitoring

Parameters: 1-hour TSP and 24-hour TSP.
Frequency: Once every six days for 24-hour TSP and three times every six days for 1-hour TSP.
Duration: Throughout the construction period.

Noise Monitoring

Parameters: One set of $L_{eq(30min)}$ as 6 consecutive $L_{eq(5min)}$ between 0700 and 1900 hours on normal weekdays.
$L_{eq(5min)}$, L_{10} and L_{90} during the construction undertaken during Restricted Hours (from 1900 to 0700 hours of the following day and full day of public holiday and Sunday)

Frequency: Once every six days during 0700 to 1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.

Duration: Throughout the construction period.

Water Quality Monitoring of Local Stream Course

Parameters: DO, Turbidity and SS.

Frequency: 3 days per week.

Depth: mid-depth

Duration: Throughout the construction period and the interval between 2 sets of monitoring is not less than 36 hours

Landscape and Visual Monitoring

Parameters: Site inspection with broad scope of audit as listed in the EM&A Manuals

Frequency: Once every 2 weeks

Duration: Throughout the construction period

Site inspection and Audit

Frequency: Once per week.

Duration: Throughout the construction period.

ENVIRONMENTAL QUALITY CRITERIA

3.10 The environmental quality criteria i.e. Action and Limit levels (herein after 'A/L levels') are listed in Table 3-5, 3-6 and 3-7 below.

Table 3-5 Action and Limit Levels for Air Quality Monitoring

Monitoring Location	Action Level (μg /m^3)		Limit Level (μg /m^3)	
	1-hour	24-hour	1-hour	24-hour
AM1	305	162	500	260
AM2	310	190	500	260

Table 3-6 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	0700-1900 hrs on normal weekdays	
NM1	When one or more documented complaints are received	70 dB(A) of $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays, reduced to 65 dB(A) during school examination periods
NM2		70 dB(A) of $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays

Table 3-7 Action and Limit Levels for a Local Stream Water Quality Monitoring (R1b)

Parameter	Action Level	Limit Level
DO (mg/L)	4.6	4 mg/L or 40% saturation at 15^{o}C
Turbidity (NTU)	15.6	16.2
SS (mg/L)	31.5	31.9

ENVIRONMENTAL MITIGATION MEASURES

3.11 Environmental Mitigation Implementation Schedule (EMIS) such as the construction dust, noise, wastewater and waste management shall be performed in accordance with the project EM&A Manual Appendix A requirements.

4 MONITORING RESULTS AND BREACHES OF ENVIRONMENTAL QUALITY CRITERIA

AIR QUALITY MONITORING

4.01 Monitoring results and breaches of air quality A/L levels during the Reporting Period are tabulated in ***Tables 4-1*** and ***4-2*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-1 Summary of Air Quality Monitoring Results, (μg/m^3)

Date	24-hour TSP		Date	1-hour TSP					
				AM1			AM2		
	AM1	AM2		1st hour	2nd hour	3rd hour	1st hour	2nd hour	3rd hour
3-May-12	34	29	3-May-12	128	111	134	148	119	114
9-May-12	29	34	9-May-12	192	186	213	174	181	162
15-May-12	20	20	15-May-12	133	152	178	148	126	111
21-May-12	32	23	21-May-12	184	161	155	138	145	143
26-May-12	20	10	26-May-12	89	101	93	100	91	95
1-Jun-12	34	45	1-Jun-12	100	123	116	102	95	111
7-Jun-12	34	43	7-Jun-12	154	182	180	177	142	108
13-Jun-12	30	26	13-Jun-12	129	114	128	96	103	119
19-Jun-12	40	35	19-Jun-12	63	62	71	59	67	70
25-Jun-12	36	18	25-Jun-12	134	111	129	99	105	101
30-Jun-12	20	20	30-Jun-12	63	56	62	71	63	58
6-Jul-12	24	12	7-Jul-12	86	73	99	81	96	74
12-Jul-12	27	26	13-Jul-12	66	71	65	91	87	85
18-Jul-12	35	101	19-Jul-12	58	62	64	76	69	59
24-Jul-12	98	#	25-Jul-12	78	71	79	86	59	60
30-Jul-12	84	120	31-Jul-12	189	196	173	203	196	186
Average (Range)	**37 (20 – 98)**	**37 (10 – 120)**	**Average (Range)**	**117 (56-213)**			**109 (58-203)**		

 # Power failure occurred after typhoon.

Table 4-2 Summaries of Breaches of Air Quality A/L Levels

Location	Exceedance	1-hour TSP	24- hour TSP	Total
AM1	Action Level	0	0	0
	Limit Level	0	0	0
AM2	Action Level	0	0	0
	Limit Level	0	0	0

4.02 As shown in ***Table 4-1***, all 1-hour TSP and 24-hour TSP monitoring results were fluctuated below the Action Level in this Reporting Period.

CONSTRUCTION NOISE MONITORING

4.03 Monitoring results and breaches of construction noise A/L levels during the Reporting Period are tabulated in ***Tables 4-3*** and ***4-4*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-3 Summary of Construction Noise Monitoring Results ($L_{eq(30min)}$, dB(A))

Date	(*) NM1	(*) NM2
3-May-12	69.7	62.0
9-May-12	68.0	63.1
15-May-12	67.5	65.7
21-May-12	69.1	65.5
26-May-12	68.8	64.3
1-Jun-12	67.0	68.8
7-Jun-12	65.5	66.7
13-Jun-12	64.8	65.3
19-Jun-12	62.9	64.5
25-Jun-12	64.0	61.8
30-Jun-12	64.8	62.8

Date	(*) NM1	(*) NM2
7-Jul-12	63.2	63.8
13-Jul-12	64.1	63.6
19-Jul-12	63.9	65.0
25-Jul-12	65.1	67.0
31-Jul-12	62.2	60.0

Remarks: (*) A façade correction of +3dB(A) has been added according to acoustical principles and EPD guidelines.
(#) The noise limit level was reduced to 65dB(A) during the school exam period.

Table 4-4 Summaries of Breaches of Construction Noise A/L Levels

Station	Limit Level	Action Level	Received Date
NM1	0	Noise complaint	NA
NM2	0		

4.04 As shown in ***Table 4-3***, all the measured noise values are fluctuated below the Limit level. Neither documented construction complaint nor exceedance of Limit level was recorded during the Reporting Period. Neither NOE nor corrective action was therefore recommended.

WATER QUALITY MONITORING – LOCAL STREAM COURSE

4.05 In this Reporting Period, a total of **39** events of local stream course monitoring were undertaken. Statistical analyses for the monitoring results are summarized in ***Table 4-5*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-5 Statistics of the Monitoring Results

Statistics	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
Min	4.7	4.3	4.0
Average	6.0	14.1	23.5
Max	9.6	81.1	217.0

4.06 Breaches of water quality A/L levels and statistical analysis of compliance for the water quality monitoring results are summarized in ***Table 4-6***.

Table 4-6 Summaries of Breaches of the Existing Water Quality A/L Levels

Construction Month	No. of sample analysis in each Parameter	Exceedance	DO	Turbidity	SS
May 2012	13	Action Level	0	0	0
		Limit Level	0	0	0
		Sub-Total	0	0	0
June 2012	13	Action Level	0	0	0
		Limit Level	0	0	0
		Sub-Total	0	0	0
July 2012	13	Action Level	0	0	0
		Limit Level	0	**3**	**3**
		Sub-Total	0	**3**	**3**
Total	39	**Action Level**	0	0	0
		Limit Level	0	**3**	**3**
Percentage of compliance			**100%**	**92.3%**	**92.3%**
Total % of compliance for water quality			**94.9%**		

4.07 As shown in ***Table 4-6,*** a total of six (6) Limit Level exceedances namely 3 in turbidity and 3 in SS were recorded at water samples collected from location "R1b". NOEs were issued to relevant parties upon confirmation of the results.

4.08 Investigation report for the cause of exceedance has been conducted and the findings are

summarized as below:-

- The water quality in Tin Shui Wan Nullah was seriously affected by the typhoon and successive rainstorm during the week of 23 to 27 July 2012. As observed by the monitoring team, broken tree branches as well as debris were found inside the Nullah which increased the turbidity and suspended solids level. Also, cloudy water was observed throughout the Nullah.
- Construction activities within the DP site at Ha Tsuen Sewage Pumping Station was halted on 23 and 27 July 2012 due to typhoon and heavy rainstorm, therefore, the water quality exceedances recorded on these days were unlikely related to the works under the Project.
- Only steel fixing work was undertaken at Ha Tsuen Sewage Pumping Station on 25 July 2012 which is not considered highly likely to generate adverse water quality impacts.
- Although daily discharge continued, the wastewater has been treated with the de-silting facility before discharge off the site and no exceedance was recorded before the typhoon and rainstorm.
- In addition, no exceedance was recorded during the subsequent water quality monitoring on 31 July 2012. The measured turbidity and suspended solids values drop back to normal level after the week of typhoon and rainstorm.
- It is concluded that the exceedances were not related to the works under the Project.

RESULTS OF LANDSCAPE AND VISUAL IMPACT

4.09 The monitoring and audit works for landscaping and visual is undertaken by the Contractor and the monitoring findings will be submitted as a stand-alone document separately. During the regular weekly site inspection, it was observed that all the retained and transplanted trees were well protected by site hoarding and fence erection, and were in good condition. Details of the inspections and observations will be reported in a stand-alone document "Results of Landscape and Visual Impact Monitoring" and it will be submitted separately for each Reporting Period.

RESULTS OF EFFLUENT MONITORING

4.10 Monitoring of effluent quality should follow the requirements specified in Section 4.3 of the approved EM&A Manual. A discharge license under Water Pollution Control Ordinance has been obtained by the Contractor upon commencement of the Project. The licensee shall perform self-monitoring as and when required by the Authority.

4.11 Effluent quality monitoring was conducted by the Contractor on 21 June 2012. The required testing determinant such as pH, total suspended solids and chemical oxygen demand were carried out in a HOKLAS laboratory. The flow rate was estimated in term of the water pump capacity and the duration of water discharge. As advised by the Contractor, the flow rate of the day is 13.5m^3/day and it is calculated by a pumping rate 0.09 m^3/min for 150 minutes.

4.12 For effluent quality monitoring as per the discharge license requirement, based on results provide by the Contractor, all determinant was complied with the discharge license requirement.

5 WASTE MANAGEMENT

5.01 Waste management was performed by an on-site Environmental Officer or an Environmental Supervisor from time to time. A Billing Account (The account number 700947) under the ***Waste Disposal (Charges for Disposal of Construction Waste) Regulation*** has already been assigned on 7 October 2009, a discharge license No. WT00005671-2009 under Section 20 of the ***Water Pollution Control Ordinance*** has been issued. CSCE has also registered as a Chemical Waste Producer with EPD under the Waste Disposal (Chemical Waste) (General) Regulation and the Waste Producer Number assigned is WPN: 5213-511-C3570-01 dated 13 November 2009.

RECORDS OF WASTE QUANTITIES

5.02 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

5.03 Whenever possible, materials were reused on-site as far as practicable. The quantities of waste for disposal in the Reporting Period are summarized in ***Tables 5-1*** and ***5-2***. The Monthly Summary Waste Flow Table provided by the Contractor can be found at the relevant EM&A monthly report.

Table 5-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity			Disposal Location
	May 12	Jun 12	Jul 12	
C&D Materials (Inert) (m^3)	0	0	0	-
Reused in this Contract (Inert) (m^3)	0	0	0	-
Reused in other Projects (Inert) (m^3)	0	0	0	-
Disposal as Public Fill (Inert) (m^3)	3,213	1,524	3,132	Tuen Mun Area 38

Table 5-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity			Disposal Location
	May 12	Jun 12	Jul 12	
Recycled Metal (kg)	0	0	0	-
Recycled Paper/Cardboard Packing (kg)	0	0	0	-
Recycled Plastic (kg)	0	0	0	-
Chemical Wastes (kg)	0	0	0	-
General Refuses (m^3)	1	1	1	NENT Landfill

5.04 There was no site effluent or surface runoff discharged in the Reporting Period. The Monthly Summary Waste Flow Table provided by the Contractor can found from the relevant EM&A monthly report.

6 SITE INSPECTIONS

6.01 According to the Environmental Monitoring and Audit Manual, regular environmental site inspections had been carried out by ET joined with the Contractor and ER to confirm the environmental performance. During the Reporting Period, ***14*** events of the joint site inspections were undertaken to evaluate the site environmental performance. No non-compliance was noted but ***6*** observations and ***6*** reminders were recorded during the site inspections within the Reporting Period.

6.02 The summaries of the findings are presented in ***Table 6-1*** and the site inspection checklists can be found in relevant EM&A monthly report.

Table 6-1 Site Reminders/Observations Found in the Reporting Period

Date	Findings / Deficiencies	Follow-Up Status
2 May 2012	• Rain water was observed ponding within the site along Ha Tsuen Sewage Pumping Station. Mosquito control measures is reminded.	Ponding water was not observed at Ha Tsuen Pumping Station during site inspection on 8 May 2012.
8 May 2012	• Oil drum without drip tray was observed within the site at Ha Tsuen Sewage Pumping Station. Drip tray is required or removal of the oil drum from the site is required.	Oil drum without drip tray was not observed within the site at Ha Tsuen Pumping Station during site inspection on 8 May 2012.
17 May 2012	• Reminder: Discharge of groundwater was observed at Ha Tsuen Sewage Pumping Station after pre-treatment via sedimentation pond. Compliance with all requirements stipulated in the Discharge License is reminded.	Not required for reminder.
22 May 2012	• Reminder: Dusty and dry surface was observed within the site at Ha Tsuen Sewage Pumping Station. Construction dust suppression measures are reminded during dusty construction activities under dry and windy conditions.	Not required for reminder.
29 May 2012	• No environmental issue was observed during site inspection.	N.A.
5 June 2012	• Reminder: Discharge of groundwater generated from Ha Tsuen Sewage Pumping Station after sedimentation was observed. Compliance with discharge license i.e. regular water quality testing, is reminded.	Not required for reminder.
15 June 2012	• Reminder: Dusty construction was observed within construction site at and Ha Tsuen Sewage Pumping Station. Full implementation of the required environmental mitigation, particularly watering during dusty activities under dry and windy conditions is reminded.	Not required for reminder.
19 June 2012	• No environmental issue was observed during site inspection.	N.A.
26 June 2012	• Ground water was observed overflowing from underground balancing pond causing flooded area within the site at Ha Tsuen	Flooded area and excessive construction waste were not observed during site inspection

	Sewage Pumping Station. Remediation measures are required. • Excessive construction waste was observed within the site at Ha Tsuen Sewage Pumping Station. Regular clearance is recommended.	on 3 July 2012.
3 July 2012	• Reminder: Dry and dusty surfaces were observed within the site at Ha Tsuen Sewage Pumping Station. Construction dust suppression measures are reminded.	Not required for reminder.
10 July 2012	• No environmental issue was observed during site inspection.	N.A.
17 July 2012	• Discharge of groundwater from the site at Ha Tsuen Sewage Pumping Station was observed with considerably higher flow rate than Discharge Licence Limit of 15m^3/day. Reduction of flow rate to below 15m^3/day or application of variation of flow rate limit is required.	Discharge of groundwater from the site was not observed at Ha Tsuen Pumping Station during site inspection on 25 July 2012.
25 July 2012	• No environmental issue was observed during site inspection.	N.A.
31 July 2012	• Excessive discharge and flooded area was observed within the site at Ha Tsuen Sewage Pumping Station. The sources of flood were overflow from underground balancing water pond. Remedial actions are required to rectify the situation. • Reminder: Fallen trees/branches due to typhoon were observed at Ha Tsuen Sewage Pumping Station. Regular clearance and proper disposal of the fallen trees/ branches is reminded.	To be followed in August 2012. Not required for reminder.

6.03 In general, it is reminded that air quality mitigation measures such as wheel washing facility at site exit/ entrance should be properly maintained. Besides, discharge of groundwater generated from Ha Tsuen Sewage Pumping Station after sedimentation was observed and compliance with discharge license i.e. regular water quality testing, is reminded. Overall, the environmental performance of the Project was considered satisfactory.

7 NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

NON-COMPLIANCE

7.01 Six (6) Limit Level exceedances in water quality monitoring were recorded in this Reporting Period. However, the exceedances were identified not related to the project in accordance with the investigation of finding.

7.02 No non-compliance or deficiency was identified during regular site inspection and environmental audit. No associated remedial actions were recommended.

ENVIRONMENTAL COMPLAINT

7.03 No documented noise, air quality or water quality complaint was received by the Contractor or ER or EPD. The statistical summary table of environmental complaint is presented in ***Table 7-1***.

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
February 2010 - April 2012	3	3	Air (2)/ Noise (1)
May 2012	0	3	NA
June 2012	0	3	NA
July 2012	0	3	NA

NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

7.04 No notifications of summons and successful prosecutions were recorded during the Reporting Period. No associated remedial actions were recommended. The statistical summary table of environmental summons and successful prosecution are presented in ***Tables 7-2 and 7-3***.

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
February 2010 - April 2012	0	0	NA
May 2012	0	0	NA
June 2012	0	0	NA
July 2012	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
February 2010 - April 2012	0	0	NA
May 2012	0	0	NA
June 2012	0	0	NA
July 2012	0	0	NA

8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Environmental Monitoring and Audit Manual covered the issues of dust, noise and waste.

8.02 The Contractor had been implementing the required environmental mitigation measures according to the Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented during the Reporting Period are summarized in ***Table 8-1***.

Table 8-1 Environmental Mitigation Measures Implementation in the Reporting Period

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater were appropriately treated by treatment facilities; • Drainage channels were provided to convey run-off into the treatment facilities; • Drainage systems were regularly and adequately maintained. • De-silting facility was provided to treat the discharged water; also the treated water was reused for spraying the road surface; • Exposed stockpiles and exposed soil surfaces were covered with tarpaulin or impervious sheets to minimise dust emission; • The stockpiles of materials were placed in the locations away from the drainage channel so as to avoid releasing materials into the channel; • Wheel washing facilities has been provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles; • A discharge licence was issued by EPD for discharging effluent from the construction site; • A licensed waste collector have been applied from EPD; and • Illegal disposal of chemicals should be strictly prohibited.
Air Quality	• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; • Tarpaulin covering of any dusty materials on a vehicle leaving the site; • Water sprinkler system was provided at haul road to reduce dust emissions during the vehicles passing through the haul road; • The vehicle speed within the site is limited to 5km/hr; and • Wheel washing facilities have been provided at the site exit.
Noise	• Good site practices to limit noise emissions at the sources; • Use of quiet plant and working methods according to EP-327/2009/A; • Use of site hoarding with noise barriers to screen noise at ground level of NSRs; • Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs according to EP-327/2009/A; • Use of temporary noise barrier with surface density 7kg/m^2 to be assumed that the noise reduction is 10 dB(A) for stable plants and 5dB(A) for movable plant in accordance with approved EIA Report Appendix 4A Table 4A3.2; • Idle equipment are turned off or throttled down; • No construction works shall be undertaken during school examination period in the Ha Tsuen Sewage Pumping Station according to EP-327/2009/A; and • Alternative use of plant items within one worksite, where practicable.

Issues	Environmental Mitigation Measures
Waste and Chemical Management	• Excavated material was reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment was recycled if possible; • Waste arising was kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor adopted a trip ticket system for the disposal of C&D materials to any designed public filling facility and/ or landfill; • Chemical waste was handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes; • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • To encourage collection of aluminium cans by individual collectors, separate labelled bins were provided to segregate this waste from other general refuse generated by the workforce; • Any unused chemicals or those with remaining functional capacity were recycled; • Prior to disposal of C&D waste, wood, steel and other metals were separated for re-use and recycling and inert waste utilised as fill material to minimise the quantity of waste to be disposed of to landfill; • Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.
Landscape and Visual	• Hoarding was erected around site boundary properly; • The transplanted tree and landscaping plants were kept in regular inspection; • All preserved trees were protected and fenced off properly; • No construction activities were carried out in the protection zone of the preserved trees.
General	• The site was generally kept tidy and clean.

9 CONCLUSIONS AND RECOMMENTATIONS

CONCLUSIONS

9.01 This is the **10th** quarterly EM&A summary report under Environmental Permit No.EP-327/2009/A for the *Expansion of Ha Tsuen Sewage Pumping Station*, covering the period from **1 May to 31 July 2012.**

9.02 No 1-hour TSP and 24-hour TSP monitoring results that triggered the Action or Limit Level was recorded in this Reporting Period.

9.03 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results exceeded the Limit Level were recorded in this Reporting Period.

9.04 For water quality monitoring, a total of six (6) Limit Level exceedances namely 3 in turbidity and 3 in SS were recorded. As observed by the monitoring team, the water quality in Tin Shui Wan Nullah was seriously affected by the typhoon and successive rainstorm during the week of 23 to 27 July 2012. Investigation report for the cause of exceedance has been conducted and it was concluded that the exceedances were not related to the works under the Project.

9.05 The monitoring and audit works for landscaping and visual is undertaken by the Contractor and the monitoring findings were submitted as a stand-alone document separately. During the regular weekly site inspection, it was observed that all the retained and transplanted trees were well protected by site hoarding and fence erection, and were in good condition. Details of the inspections and observations will be reported in a stand-alone document "Results of Landscape and Visual Impact Monitoring" and it will be submitted separately for each Reporting Period

9.06 A total of **14** occasions of joint site inspections were undertaken to evaluate the site environmental performance. No non-compliance was noted but **6** observations and **6** reminders were recorded during the site inspections within the Reporting Period.

9.07 No documented complaint, notifications of summons and successful prosecutions were received during the Reporting Period. No adverse environmental impacts were observed during the weekly site inspection and environmental audit of the Reporting Period, indicating the implemented mitigation measures for air quality, construction noise and water quality were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

9.08 No site inspection was undertaken by EPD, the Agriculture, Fisheries and Conservation Department (AFCD) and Leisure and Cultural Services Department (LCSD) in this Reporting Period.

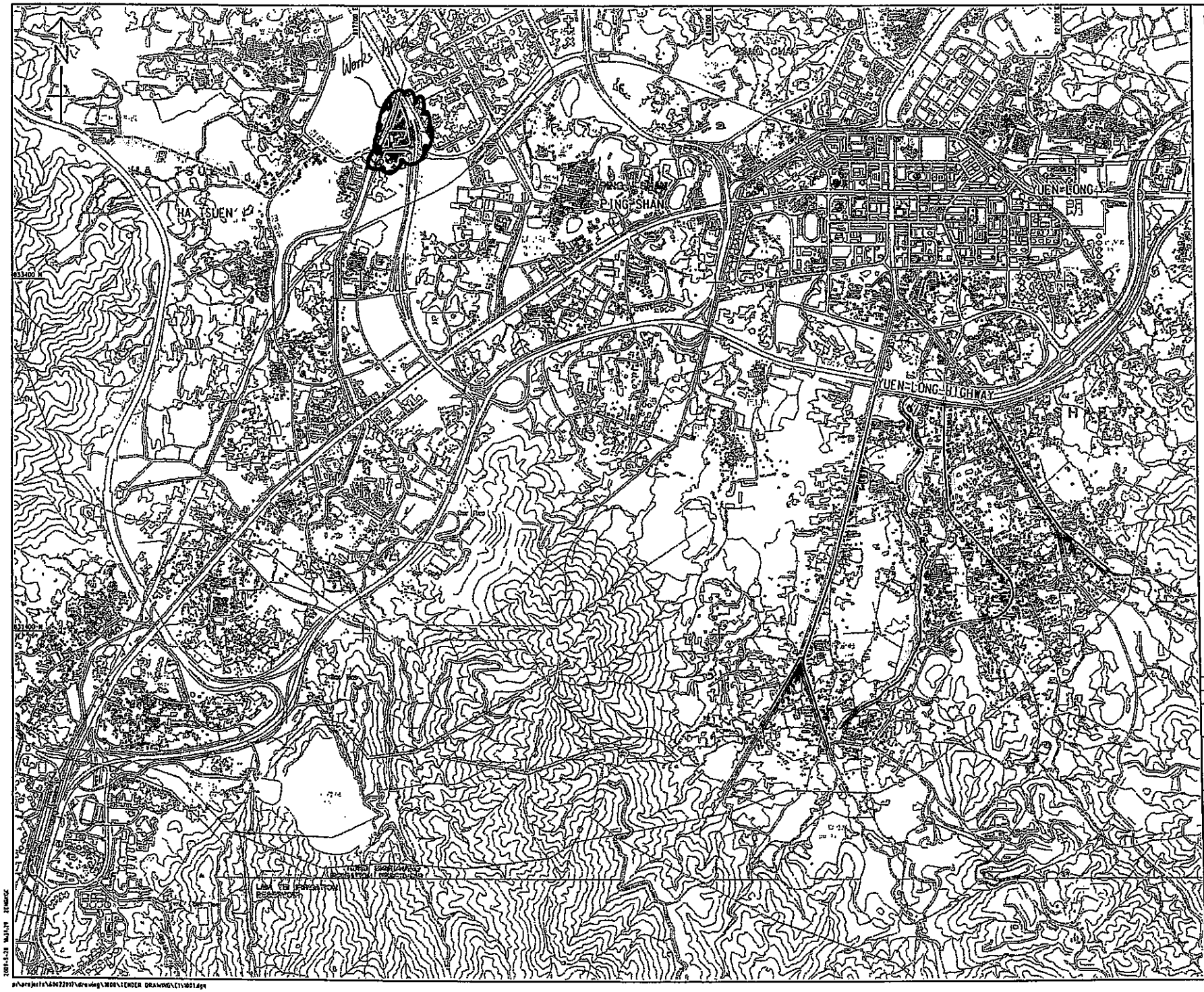
RECOMMENDATIONS

9.09 During wet season, muddy water or other water pollutants from site surface runoff into the local stream will be key environment issue. Therefore, mitigation measures to prevent surface runoff into nearby water bodies should be paid on special attention. Moreover, mitigation measures should be properly maintained to avoid fugitive dust emissions from loose soil surface or haul road.

9.10 To control the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the Environmental Monitoring and Audit Manual.

Appendix A

Site Layout Plan



-	TENDER DRAWING	DSD/ACTS	05.09

DRAINAGE SERVICES DEPARTMENT,
THE GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION

YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL - CONSTRUCTION OF YUEN LONG SOUTH BRANCH SEWERS AND EXPANSION OF HA TSUEN SEWAGE PUMPING STATION

LOCATION PLAN

AECOM

DRG NO. 60022017/C1/1001

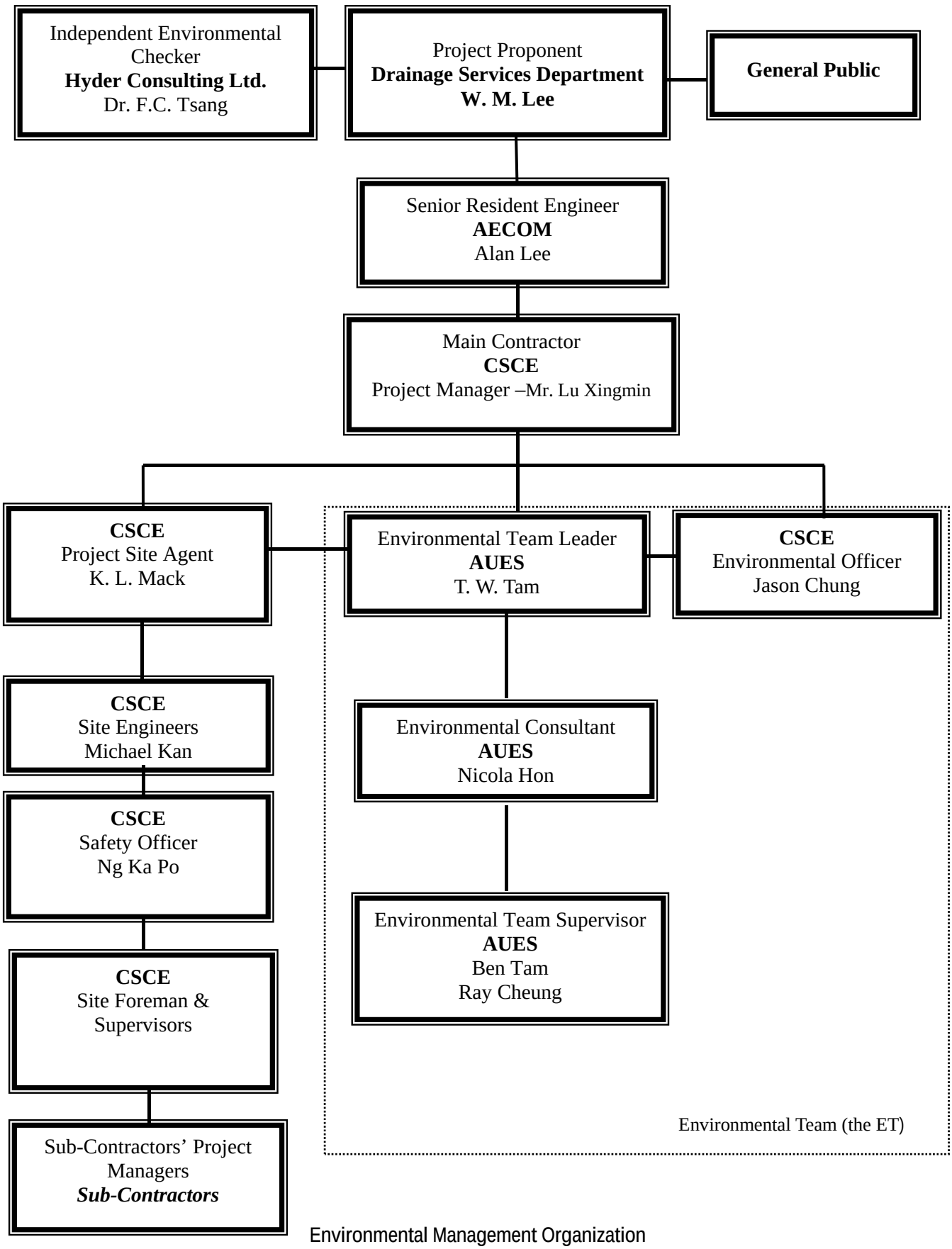
CONTRACT NO. DC/2009/08

SCALE AT A1 1 : 10000

METRES

Appendix B

Environmental Management Organization Chart



Environmental Management Organization

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. W. M. Lee	--	2827-8700
AECOM	Senior Resident Engineer	Mr. Alan Lee	9706 9568	2472 0132
Hyder	Independent Environmental Checker	Dr. F C Tsang	2911 2744	2805 5028
CSCE	Project Manager	Mr. Lu Xingmin	2472 0113	2472-0229
CSCE	Site Agent	Mr. K L Mack	2472 0113	2472-0229
CSCE	Site Engineer	Mr. Michael Kan	2472 0113	2472-0229
CSCE	Environmental Officer	Mr. Jason Chung	2472 0113	2472-0229
CSCE	Environmental Supervisor	Mr. Chan Yau Pang	2472 0113	2472-0229
CSCE	Safety Officer	Mr. Ng Ka Po	2472 0113	2472-0229
AUES	Environmental Team Leader	Mr. T. W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959-6059	2959-6079
AUES	Assistance Environmental Consultant	Mr. Ray Cheung	2959-6059	2959-6079
AUES	Team Supervisor	Mr. Ben Tam	2959-6059	2959-6079

Legend:

DSD (Employer) – Drainage Services Department

AECOM (Engineer) – AECOM

CSCE (Main Contractor) – China State Construction Engineering (Hong Kong) Ltd

Hyder (IEC) – Hyder Consulting Limited

AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

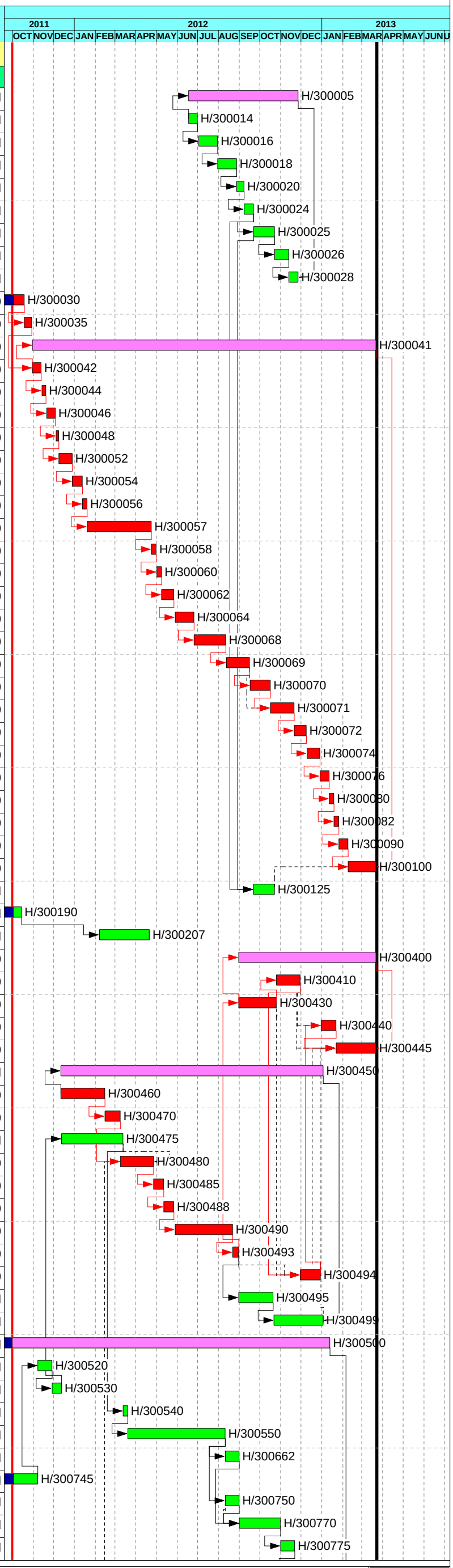
Master Construction Program

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Ha Tsuen Area

Rising Main

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
H/300005	Rising Main bet HTPS to ChC20	136 *	1	18JUN12	26NOV12	1d
H/300014	Sheet Piling bet HTPS to ChC20	12	1	18JUN12	30JUN12	1d
H/300016	Excavation and Shoring bet HTPS to ChC20	24	1	03JUL12	30JUL12	1d
H/300018	Pipe Laying bet HTPS to ChC20	24	1	31JUL12	27AUG12	1d
H/300020	Pipe Connection at ChC20	10	1	28AUG12	07SEP12	1d
H/300024	Cast Bend Block	12	1	08SEP12	21SEP12	1d
H/300025	Water Testing HTPS to C20	24	1	22SEP12	22OCT12	1d
H/300026	Backfill and Remove Sheet Pile HTPS to ChC20	18	1	23OCT12	12NOV12	1d
H/300028	Reinstatement HTPS to ChC20	12	1	13NOV12	26NOV12	1d
H/300030	XP Application for Flow Meter Chamber	75	1	16JUL11 A	18OCT11	0
H/300035	Obtain RA for TTA	10	1	19OCT11	29OCT11	0
H/300041	Rising Main bet ChC20 to ChC57	410 *	1	31OCT11	21MAR13	0
H/300042	Erect Temp Fence	12	1	31OCT11	12NOV11	0
H/300044	Remove Extg Fence	6	1	14NOV11	19NOV11	0
H/300046	Fell and Transplant Tree	12	1	21NOV11	03DEC11	0
H/300048	Remove Wheel Washing Bay	4	1	05DEC11	08DEC11	0
H/300052	Remove Existing Planter	15	1	09DEC11	28DEC11	0
H/300054	TTA for RM bet ChC20 to ChC57	12	1	29DEC11	12JAN12	0
H/300056	Remove U-channel and Catchpit	6	1	13JAN12	19JAN12	0
H/300057	Diversion of Existing Drainage	72	1	20JAN12	23APR12	0
H/300058	Trial Pits bet ChC20 to ChC57	6	1	24APR12	30APR12	0
H/300060	Relocation of Existing Gate Control Panel	6	1	02MAY12	08MAY12	0
H/300062	Sheet Piling bet ChC20 to ChC57	15	1	09MAY12	26MAY12	0
H/300064	Excavation and Shoring bet ChC20 to chC57	24	1	29MAY12	25JUN12	0
H/300068	Laying Pipe bet ChC20 to ChC57	40	1	26JUN12	11AUG12	0
H/300069	Construct Flow Meter Chamber	30	1	13AUG12	15SEP12	0
H/300070	Water Testing Ch20 to Ch57	24	1	17SEP12	16OCT12	0
H/300071	Backfill and Remove Sheet Pile	30	1	17OCT12	20NOV12	0
H/300072	New Catchpit and DN200 DI Pipe	16	1	21NOV12	08DEC12	0
H/300074	Power Supply Cable Duct and Draw Pit	15	1	10DEC12	28DEC12	0
H/300076	Extend U-channel	11	1	29DEC12	11JAN13	0
H/300080	Formation Work	6	1	12JAN13	18JAN13	0
H/300082	Reinstatement of Gate Control Panel	6	1	19JAN13	25JAN13	0
H/300090	Kerb and Footpath	12	1	26JAN13	08FEB13	0
H/300100	Reinstate ChC20 to ChC57	30	1	09FEB13	21MAR13	0
H/300125	Testing of RM bet station and extg valve chamber	24	1	22SEP12	22OCT12	91d
H/300190	ChA0 - ChA13: Reinstate Inside HTPS	12	1	16JUL11 A	14OCT11	129d
H/300207	Connection at Ch89	60	1	07FEB12	20APR12	129d
H/300400	Rising Main bet ch267 to ch280 & Washout Chamber	164 *	1	31AUG12	21MAR13	0
H/300410	Construct Washout Chamber	30	1	26OCT12	29NOV12	0
H/300430	Rising Main between ch280 to ch267	46	1	31AUG12	25OCT12	0
H/300440	Connection at ch267	18	1	31DEC12	21JAN13	0
H/300445	Reinstatement of Area	46	1	22JAN13	21MAR13	0
H/300450	Pipe Jacking between ch280 to ch387	312 *	1	12DEC11	02JAN13	16d
H/300460	Construct Jacking pit at ch280	48	1	12DEC11 *	14FEB12	0
H/300470	Setting up Pipe Jacking at ch280	20	1	15FEB12	08MAR12	0
H/300475	Preparation Works at Receiving Pit at Ch387	70	1	13DEC11	12MAR12	10d
H/300480	DN1500 Jacking Sleeve: Ch280 to Ch387	38	1	09MAR12	26APR12	0
H/300485	Demobilization of Jacking Plant	12	1	27APR12	11MAY12	0
H/300488	Setting up for Pipe Laying Ch280 to Ch387	12	1	12MAY12	26MAY12	0
H/300490	Install RM1200 bet ch280 to ch387	72	1	29MAY12	21AUG12	0
H/300493	Grouting bet RM and Pipe Sleeve	8	1	22AUG12	30AUG12	0
H/300494	Water Testing Ch267 to Ch387	24	1	30NOV12	29DEC12	0
H/300495	Insitu Bend at Ch387 and Backfill	42	1	31AUG12	20OCT12	16d
H/300499	Reinstatement of Area at ch387	60	1	22OCT12	02JAN13	16d
H/300500	Pipe Jacking between ch387 to ch815	790 *	1	14MAY10 A	12JAN13	53d
H/300520	Setting up Pipe Laying ch580 to 387 Stage 1	18	1	08NOV11	28NOV11	10d
H/300530	Install RM1200 bet 580 to ch387 Stage 1	12	1	29NOV11	12DEC11	10d
H/300540	Setting up Pipe Laying ch580 to 387 Stage 2	6	1	13MAR12	19MAR12	53d
H/300550	Install RM1200 bet 580 to ch387 Stage 2	116	1	20MAR12	10AUG12	53d
H/300662	Grouting bet RM and Pipe Sleeve Ch580 to 387	18	1	11AUG12	31AUG12	53d
H/300745	Install RM1200 bet ch815 to ch580	215	1	30APR11 A	07NOV11	10d
H/300750	Grouting bet RM and Pipe Sleeve ch580 to 815	18	1	11AUG12	31AUG12	53d
H/300770	Bend Block and Access Chamber at ch580	50	1	01SEP12	31OCT12	53d
H/300775	Backfill / Remove Sheet Pile at ch580	18	1	01NOV12	21NOV12	53d



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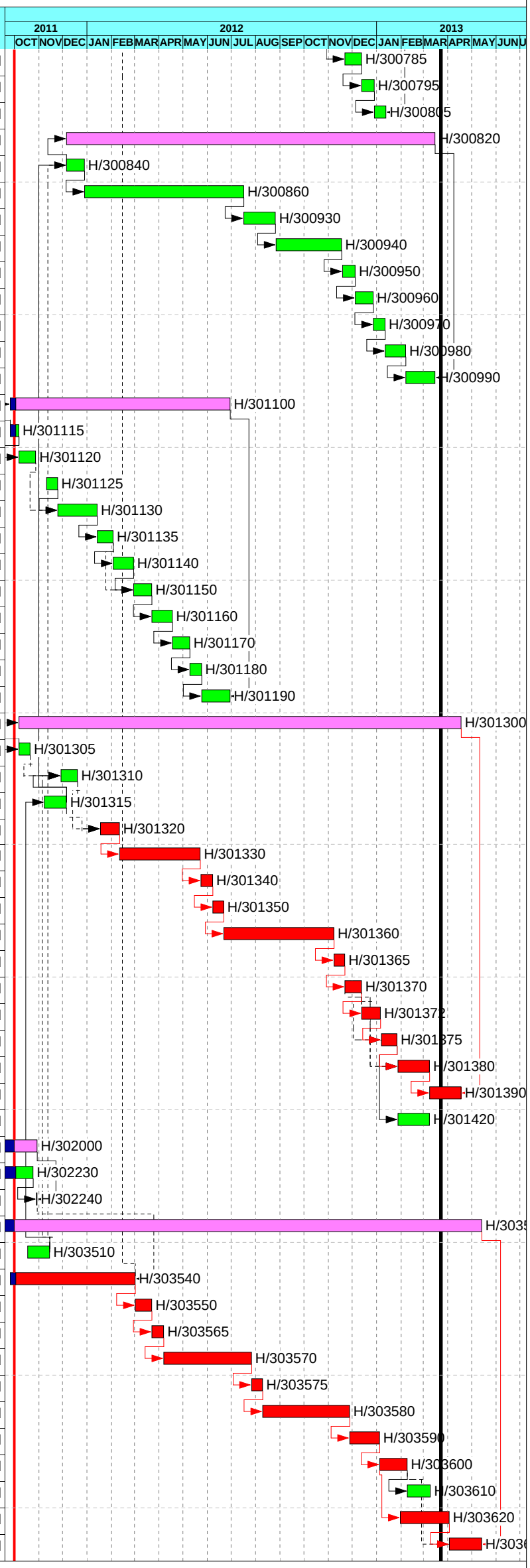
Programme of Works (Rev. 06) - Ha Tsuen Rising Main

中國建築 CHINA STATE CONSTRUCTION

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
H/300785	Reinstate Box Culvert at ch580	18	1	22NOV12	12DEC12	53d
H/300795	Reinstate Planter	12	1	13DEC12	28DEC12	53d
H/300805	Bamboo Planting	12	1	29DEC12	12JAN13	53d
H/300820	RM between ch900 to ch815	374 *	1	06DEC11	15MAR13	5d
H/300840	Setting up at ch900	18	1	06DEC11	28DEC11	5d
H/300860	Excavation ch900 to ch825	158	1	29DEC11	16JUL12	5d
H/300930	Excavation between Ch815 to ch825	35	1	17JUL12	25AUG12	5d
H/300940	Pipe Laying between ch830 to ch900	70	1	27AUG12	17NOV12	5d
H/300950	Pipe Laying between ch815 to ch830	14	1	19NOV12	04DEC12	5d
H/300960	Pipe Connection and Bend Block at Ch830	18	1	05DEC12	27DEC12	5d
H/300970	Grouting between Ch815 to Ch900	12	1	28DEC12	11JAN13	5d
H/300980	Pipe Connection and Bend Block at Ch815	22	1	12JAN13	06FEB13	5d
H/300990	Backfill and Reinstatement at Ch815 and Ch825	27	1	07FEB13	15MAR13	5d
H/301100	RM between Ch1192 to Ch1156	222 *	1	26SEP11 A	29JUN12	216d
H/301115	Sheet Piling bet Ch1156 to Ch1172	8	1	26SEP11 A	06OCT11	36d
H/301120	Excavation bet Ch1156 to Ch1172	18	1	07OCT11	27OCT11	216d
H/301125	Setting up for Heading Excavation at Ch1172	12	1	11NOV11	24NOV11	216d
H/301130	Excavation between Ch1172 to Ch1192	40	1	25NOV11	13JAN12	216d
H/301135	Setting up for Pipe Laying Ch1172 to Ch1192	12	1	14JAN12	02FEB12	216d
H/301140	Pipe Laying between Ch1172 to ch1192	22	1	03FEB12	28FEB12	216d
H/301150	Pipe Connection at Ch1192	20	1	29FEB12	22MAR12	216d
H/301160	Pipe Laying between Ch1156 to 1172	18	1	23MAR12	17APR12	216d
H/301170	Pipe Connection at Ch1172	18	1	18APR12	09MAY12	216d
H/301180	Grouting between Ch1172 to 1192	12	1	10MAY12	24MAY12	216d
H/301190	Backfill and Reinstatement at Ch1192	30	1	25MAY12	29JUN12	216d
H/301300	Pipe Line between ch 1140 to ch900	449 *	1	07OCT11	17APR13	-19d
H/301305	Sheet Piling Ch1130 to 1140	12	1	07OCT11	20OCT11	36d
H/301310	Construct Jacking Pit at Ch1130	18	1	29NOV11	19DEC11	3d
H/301315	Construct Receiving Pit at Ch900	24	1	08NOV11	05DEC11	3d
H/301320	Setting up at Ch1130	16	1	18JAN12	10FEB12	-19d
H/301330	DN1500 Jacking Sleeve: Ch1130 to Ch900	82	1	11FEB12	22MAY12	-19d
H/301340	Demobilize Jacking Plant at Ch1130	12	1	24MAY12	07JUN12	-19d
H/301350	Setting up for Pipe Laying Ch1130 to Ch900	12	1	08JUN12	21JUN12	-19d
H/301360	Install Pipe between Ch1130 to ch900	116	1	22JUN12	07NOV12	-19d
H/301365	Pipe Laying bet Ch1135 to ch1140	12	1	08NOV12	21NOV12	-19d
H/301370	Grouting between Ch1130 to Ch900	18	1	22NOV12	12DEC12	-19d
H/301372	Pipe Connection at ch1135	18	1	13DEC12	05JAN13	-19d
H/301375	Bend Block at Ch1130	18	1	07JAN13	26JAN13	-19d
H/301380	Access Chamber at Ch904	30	1	28JAN13	08MAR13	-19d
H/301390	Backfill and Reinstatement at ch900	30	1	09MAR13 *	17APR13	-19d
H/301420	Backfill and Reinstatement at Ch1130	30	1	28JAN13	08MAR13	11d
H/302000	Pipe jacking between ch 1615 to ch1793	497 *	1	23FEB10 A	29OCT11	58d
H/302230	Backfill / Reinstatement at ch1680	24	1	22JUL11 A	24OCT11	58d
H/302240	Road Opening at Ch1680	1	1	29OCT11	29OCT11	58d
H/303500	Pipe Jacking between Ch1610 to Ch1256	571 *	1	06JUN11 A	13MAY13	-40d
H/303510	Construct Receiving Pit at Ch1256	24	1	18OCT11	14NOV11	3d
H/303540	DN1500 Jacking Sleeve Ch1610 to Ch1256	128	1	26SEP11 A	01MAR12	-40d
H/303550	Demobilize Jacking Plant at Ch1610	18	1	02MAR12	22MAR12	-40d
H/303565	Setting up Pipe Laying at Ch1610	12	1	23MAR12	06APR12	-40d
H/303570	Pipe Laying between Ch1610 to Ch1440	88	1	07APR12	26JUL12	-40d
H/303575	Setting up bet Ch1440 to 1256	12	1	27JUL12	09AUG12	-40d
H/303580	Pipe Laying between Ch1440 to Ch1256	92	1	10AUG12	27NOV12	-40d
H/303590	Connection at Ch1615 to 1621 and Ch1256	30	1	28NOV12	04JAN13	-40d
H/303600	Construct Access Chamber at Ch1610 and 1256	30	1	05JAN13	08FEB13	-40d
H/303610	Grouting between Ch1610 to Ch1256	20	1	09FEB13	09MAR13	10d
H/303620	Water Test of Rising Main	48	1	31JAN13 *	02APR13	-40d
H/303640	Backfill & Reinstatement at Ch1615 to 1621& 1256	30	1	03APR13	13MAY13	-40d



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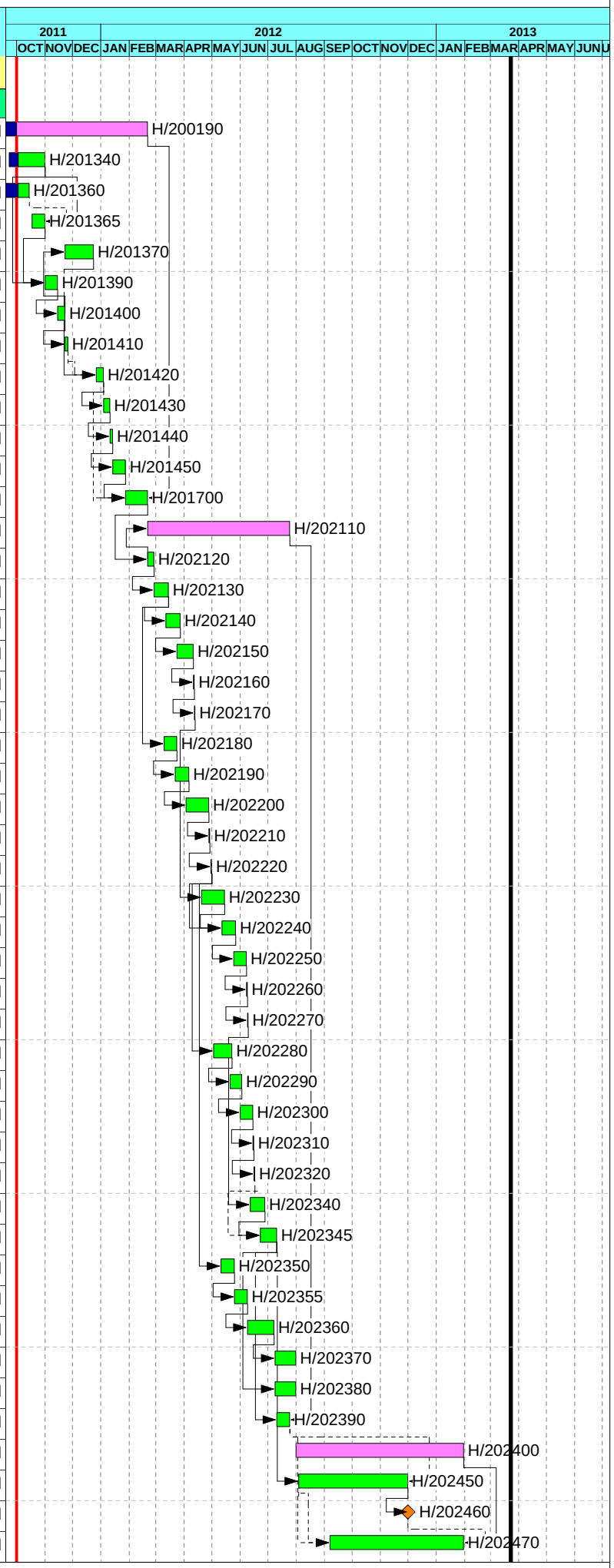
Start milestone point
Finish milestone point

Programme of Works (Rev. 06) - Ha Tsuen Rising Main

中國建築 CHINA STATE CONSTRUCTION

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Activity ID	Description	Orig Dur	Calendar	Early Start	Early Finish	Total Float
Ha Tsuen Area						
Pumping Station						
H/200190	Substructure	278 *	4	01MAR11 A	20FEB12	6d
H/201340	Wall at Coarse Screen Channel Chamber (7th Pour)	26	4	23SEP11 A	31OCT11	6d
H/201360	Complete Dry Well (9th Pour) and ground floor	12	4	14SEP11 A	14OCT11	15d
H/201365	Floor Slab at +2.65 (10th Pour)	12	4	18OCT11	31OCT11	6d
H/201370	Complete Remaining Chamber Wall (11th Pour)	27	4	23NOV11	23DEC11	6d
H/201390	Backfill up to Bottom of Middle Strut	12	4	01NOV11	14NOV11	6d
H/201400	Remove Middle Strut	7	4	15NOV11	22NOV11	6d
H/201410	Touch up Left-in Mid Strutting Area	3	4	23NOV11	25NOV11	30d
H/201420	Backfill up to Bottom of Top Strut	6	4	27DEC11	03JAN12	6d
H/201430	Remove Top Strut	6	4	04JAN12	10JAN12	6d
H/201440	Touch up Left-in Top Strutting Area	3	4	11JAN12	13JAN12	6d
H/201450	Backfill up to Ground Level	7	4	14JAN12	27JAN12	6d
H/201700	Remove Sheet Pile and Backfill	20	4	28JAN12	20FEB12	6d
H/202110	Superstructure	115 *	4	21FEB12	24JUL12	6d
H/202120	Temporary Platform and Scaffolding	6	4	21FEB12	27FEB12	6d
H/202130	Internal Formwork Lower Wall 1	14	4	28FEB12	14MAR12	6d
H/202140	Steel Fixing Lower Wall 1	14	4	12MAR12	27MAR12	6d
H/202150	External Formwork Lower Wall 1	14	4	24MAR12	10APR12	6d
H/202160	Cleaning and Checking Lower Wall 1	1	4	11APR12	11APR12	6d
H/202170	Concrete to Lower Wall 1	1	4	12APR12	12APR12	6d
H/202180	Internal Formwork Lower Wall 2	12	4	10MAR12	23MAR12	6d
H/202190	Steel Fixing Lower Wall 2	12	4	22MAR12	05APR12	6d
H/202200	External Formwork Lower Wall 2	12	4	03APR12	27APR12	6d
H/202210	Cleaning and Checking Lower Wall 2	1	4	28APR12	28APR12	6d
H/202220	Concrete to Lower Wall 2	1	4	30APR12	30APR12	6d
H/202230	Internal Formwork Upper Wall 1	12	4	20APR12	14MAY12	6d
H/202240	Steel Fixing Upper Wall 1	12	4	12MAY12	26MAY12	6d
H/202250	External Formwork Upper Wall 1	12	4	25MAY12	07JUN12	6d
H/202260	Cleaning and Checking Upper Wall 1	1	4	08JUN12	08JUN12	6d
H/202270	Concrete to Upper Wall 1	1	4	09JUN12	09JUN12	6d
H/202280	Internal Formwork Upper Wall 2	12	4	03MAY12	22MAY12	7d
H/202290	Steel Fixing Upper Wall 2	12	4	21MAY12	02JUN12	7d
H/202300	External Formwork Upper Wall 2	12	4	01JUN12	14JUN12	7d
H/202310	Cleaning and Checking Upper Wall 2	1	4	15JUN12	15JUN12	7d
H/202320	Concrete to Upper Wall 2	1	4	16JUN12	16JUN12	7d
H/202340	Roof Slab 1	14	4	12JUN12	27JUN12	6d
H/202345	Roof Slab 2	14	4	23JUN12	10JUL12	6d
H/202350	Trench at Transformer and Switch Room	12	4	11MAY12	25MAY12	38d
H/202355	Ground Floor to Transformer and Switch Room	12	4	26MAY12	08JUN12	38d
H/202360	Wall and roof to Transformer and Switch Room	24	4	09JUN12	07JUL12	38d
H/202370	Remove temp support in Transformer and SR	20	4	09JUL12	31JUL12	38d
H/202380	Staircase	20	4	09JUL12	31JUL12	38d
H/202390	Parapet	12	4	11JUL12	24JUL12	6d
H/202400	Architectural Finishes	152 *	4	01AUG12	30JAN13	38d
H/202450	Internal Finishes	100	4	04AUG12	30NOV12	67d
H/202460	Handover of Pumping Station	0	4		30NOV12	87d
H/202470	External Finishes	120	4	07SEP12	30JAN13	38d



Start date	17SEP09
Finish date	15NOV17
Run date	25OCT11
Project name	WP07
Page number	1A
c Primavera Systems, Inc.	

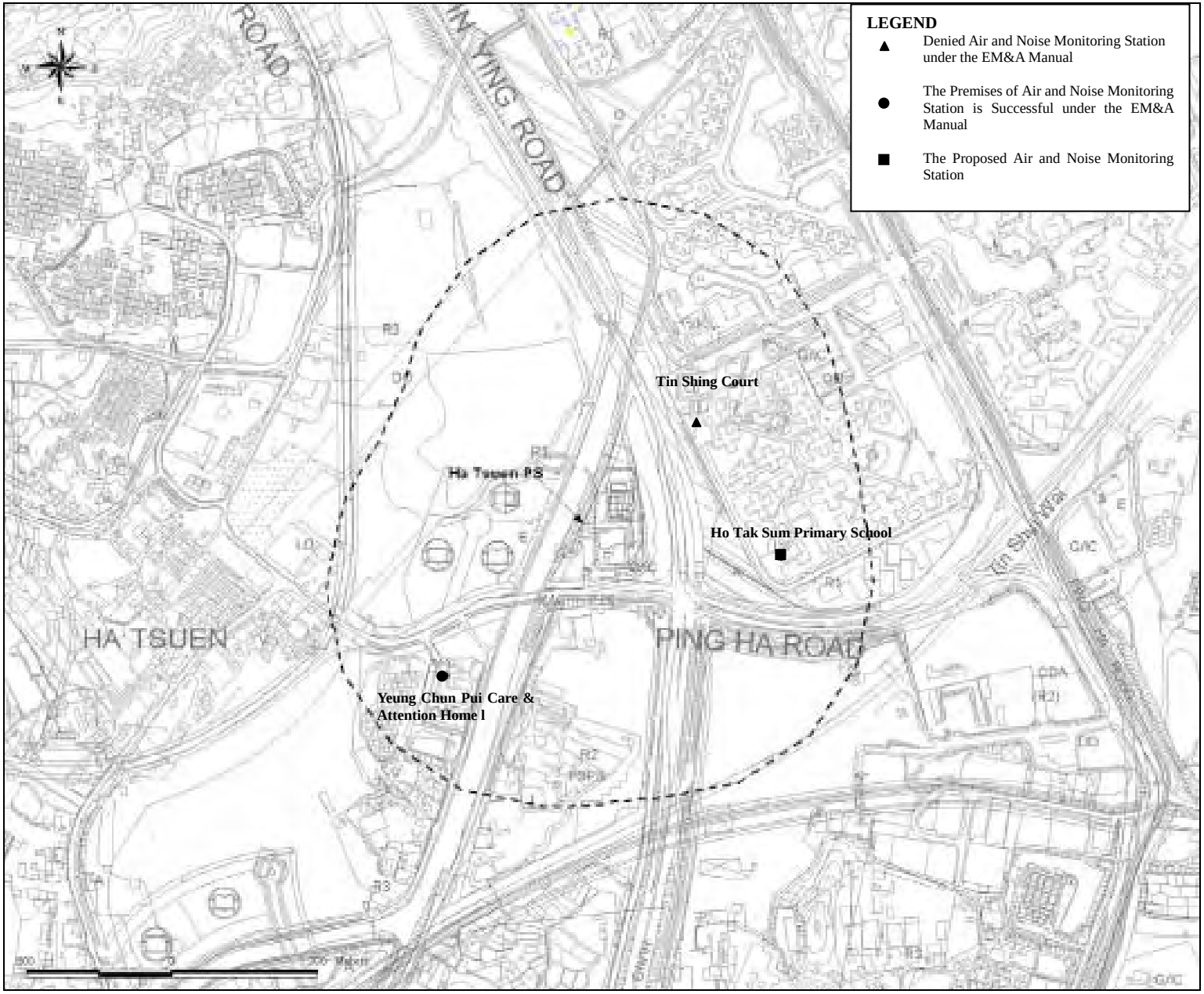
Early bar
Progress bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

Programme of Works (Rev. 06) - Ha Tsuen Sewage Pumping Station

中國建築 CHINA STATE CONSTRUCTION

Appendix D

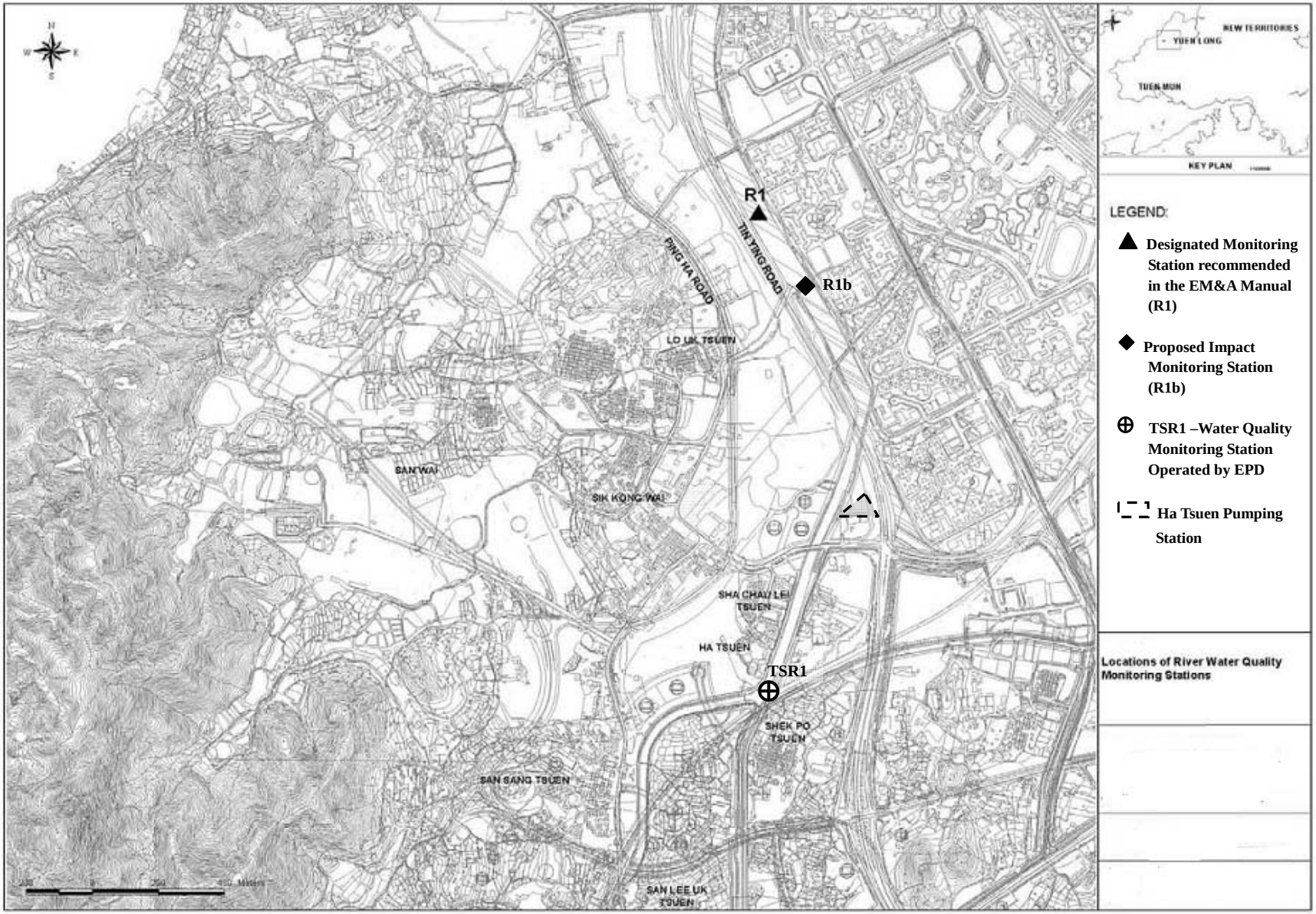
Monitoring Location of EM&A Programme


LEGEND
Denied Air and Noise Monitoring Station under the EM&A Manual
The Premises of Air and Noise Monitoring Station is Successful under the EM&A Manual
The Proposed Air and Noise Monitoring Station
Tin Shing Court
Ha Tsuen PS
Ho Tak Sum Primary School
Yeung Chun Pui Care & Attention Home l
HA TSUEN
PING HA ROAD
IN YING ROAD

DSD Contract No. DC/2009/08 – Construction of Yuen Long South Branch Sewers And Extension of Ha Tsuen Sewage Pumping Station

Proposed Water Quality Monitoring Location

AUES

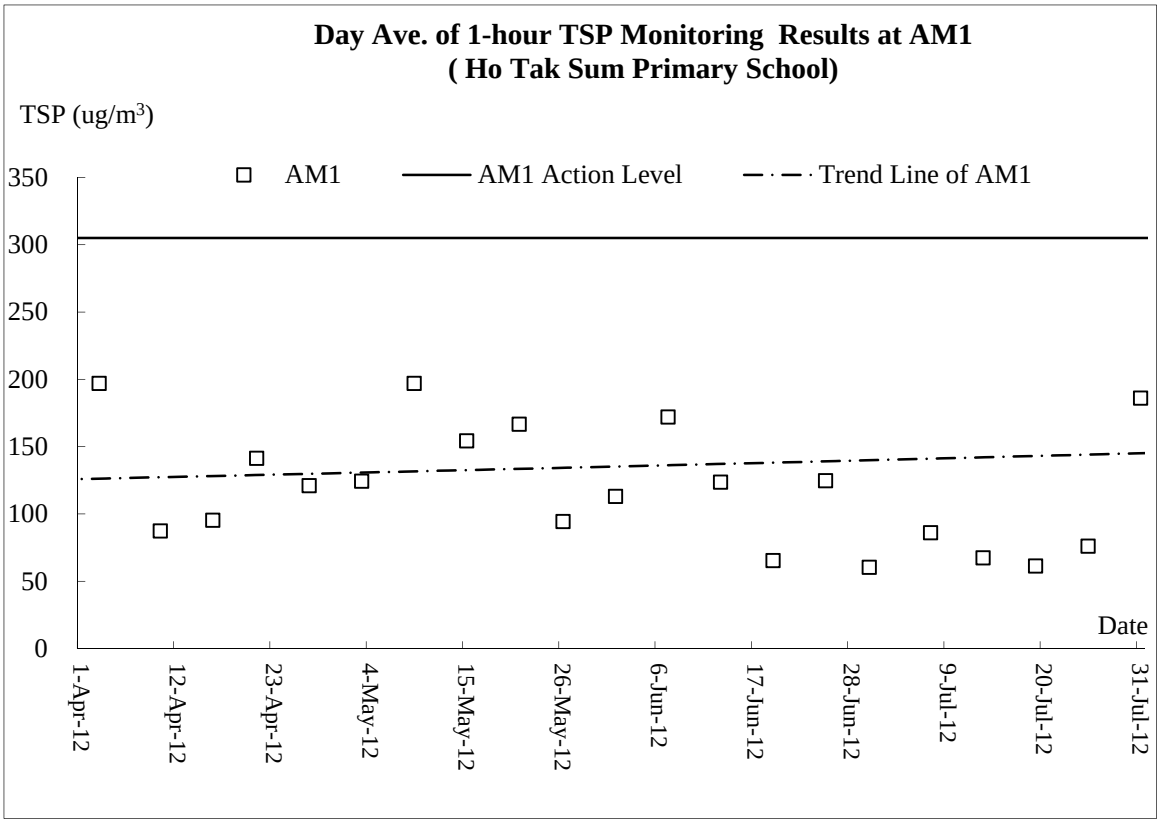


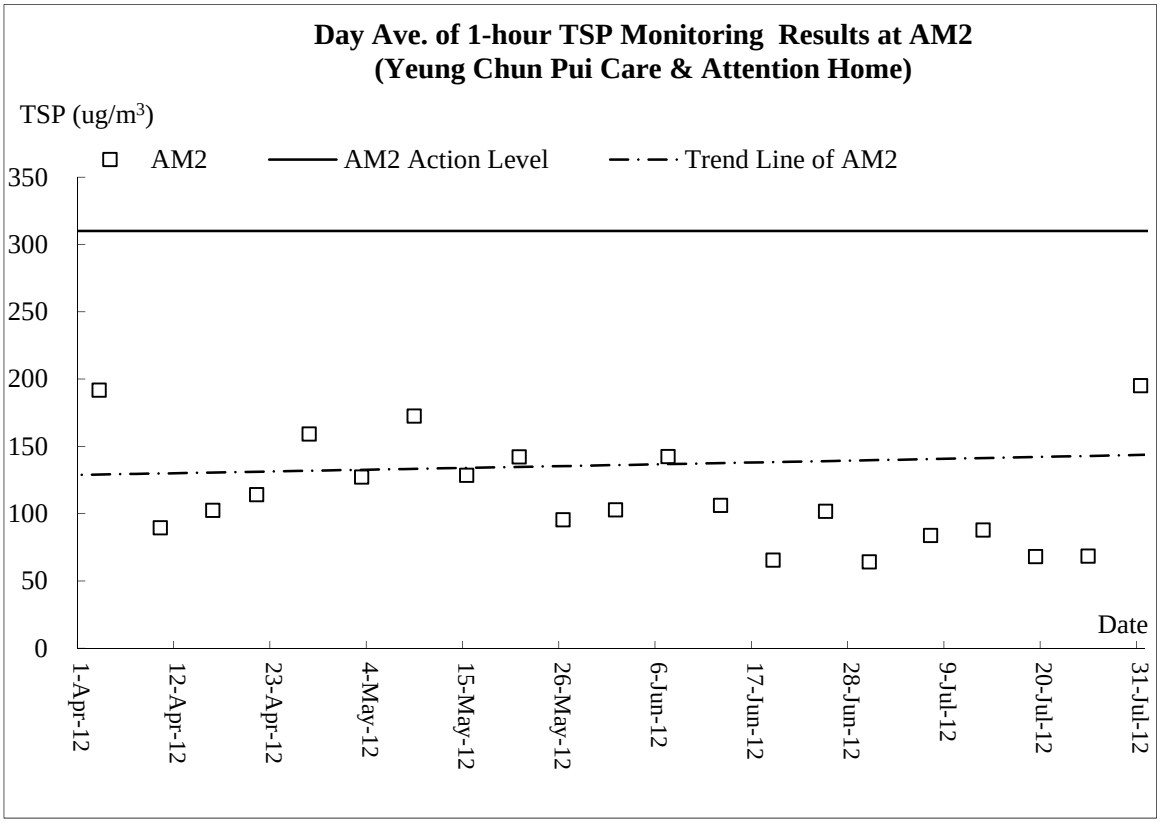
Appendix E

Graphic Plot of

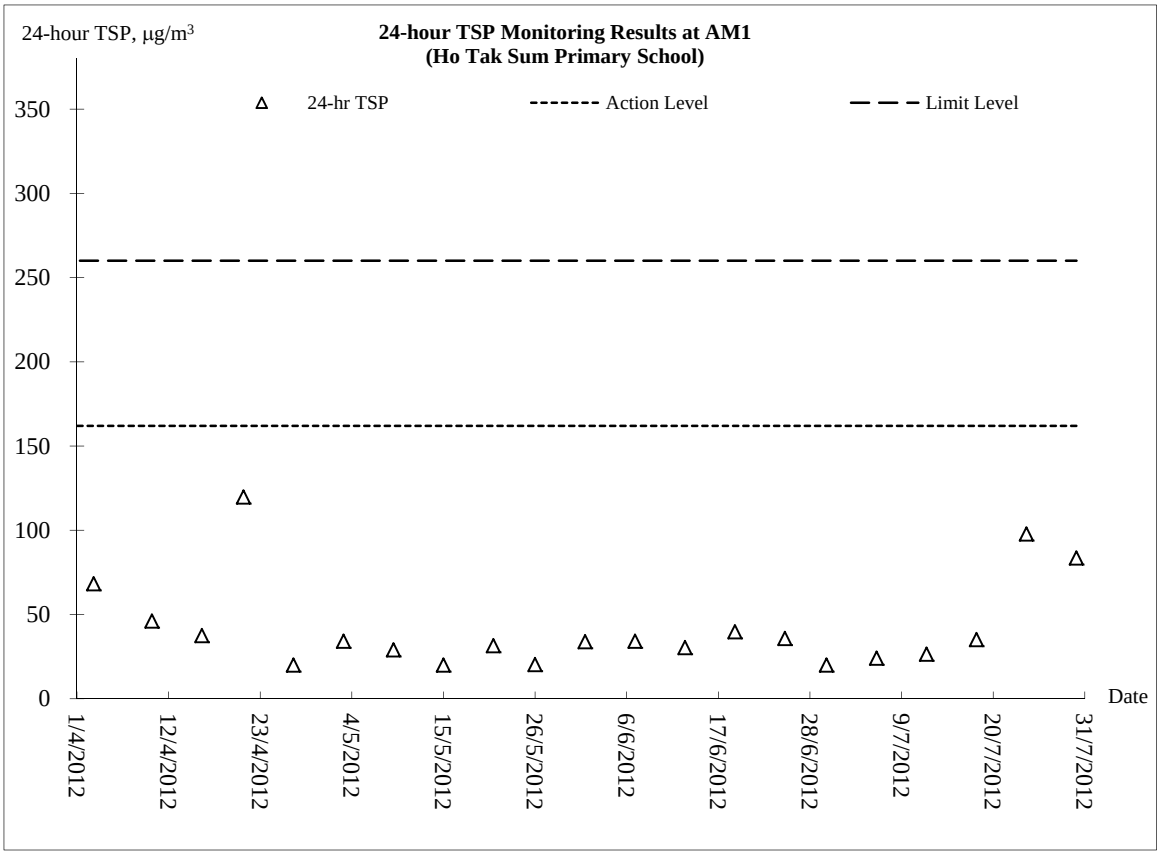
- **Air Quality**
- **Construction Noise**
- **Water Quality**

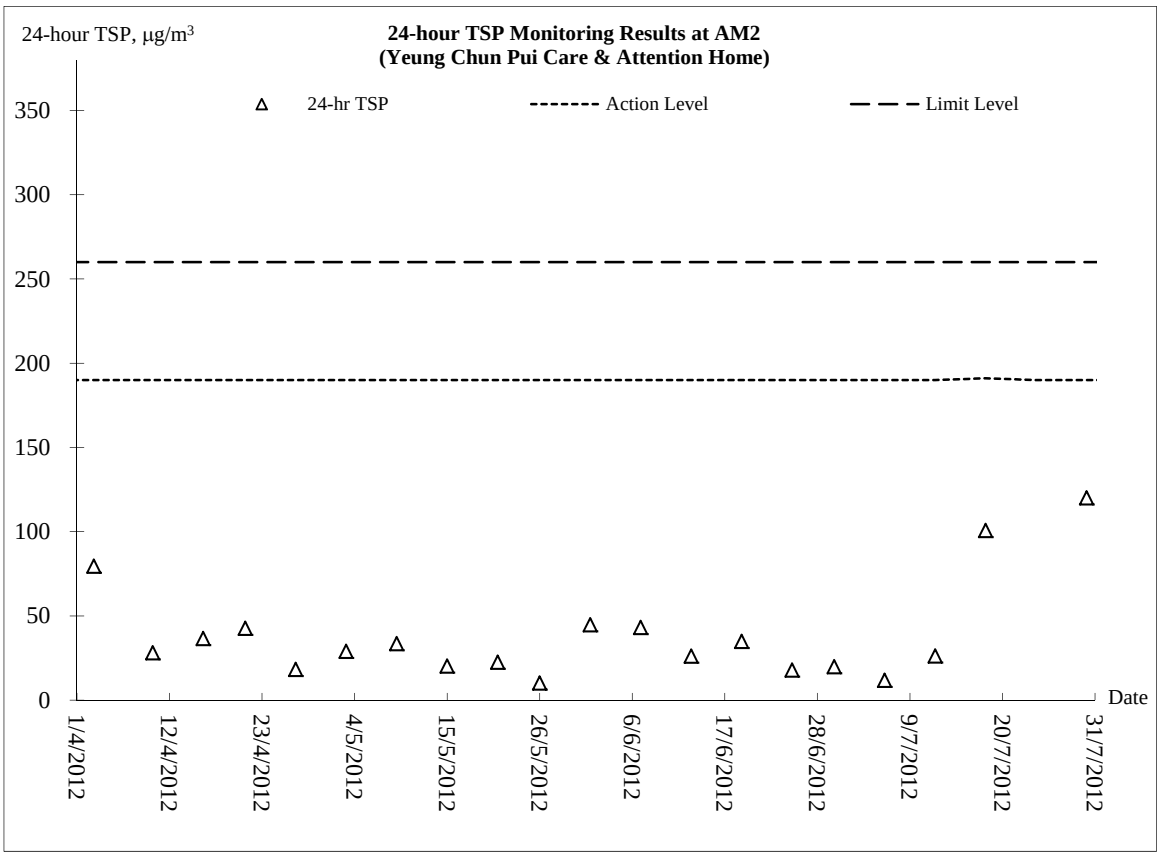
Air Quality – 1-hour TSP



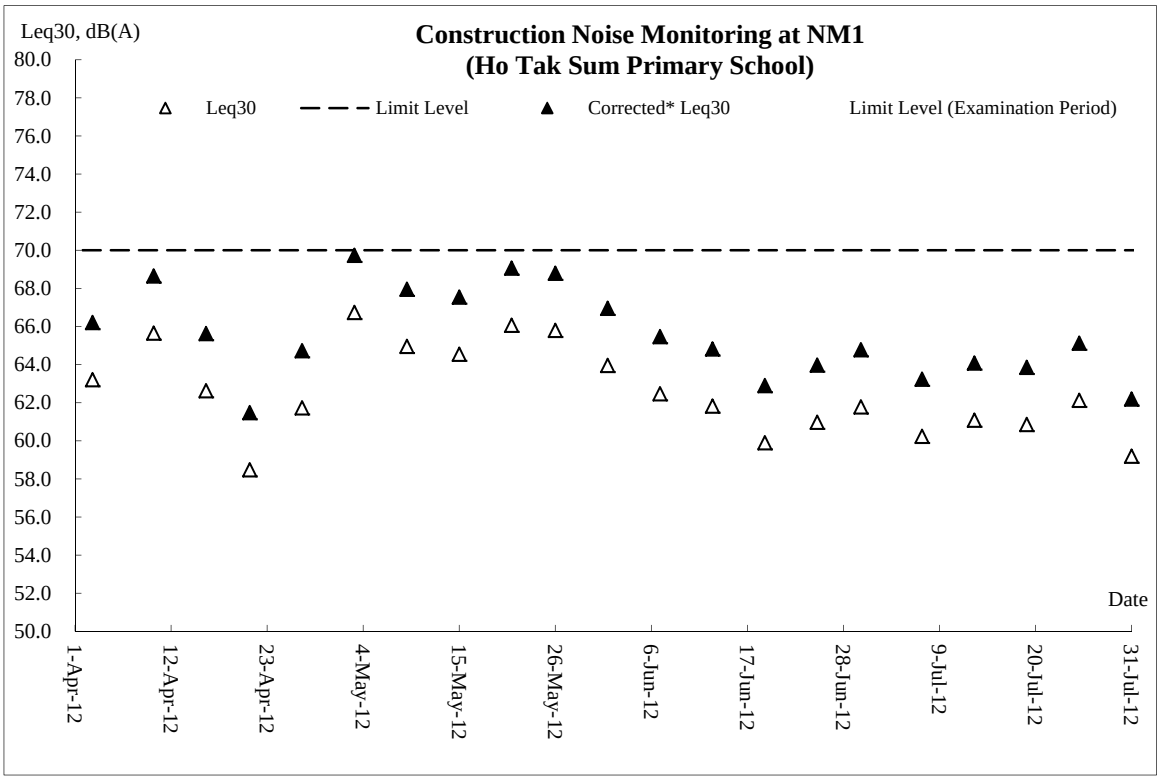


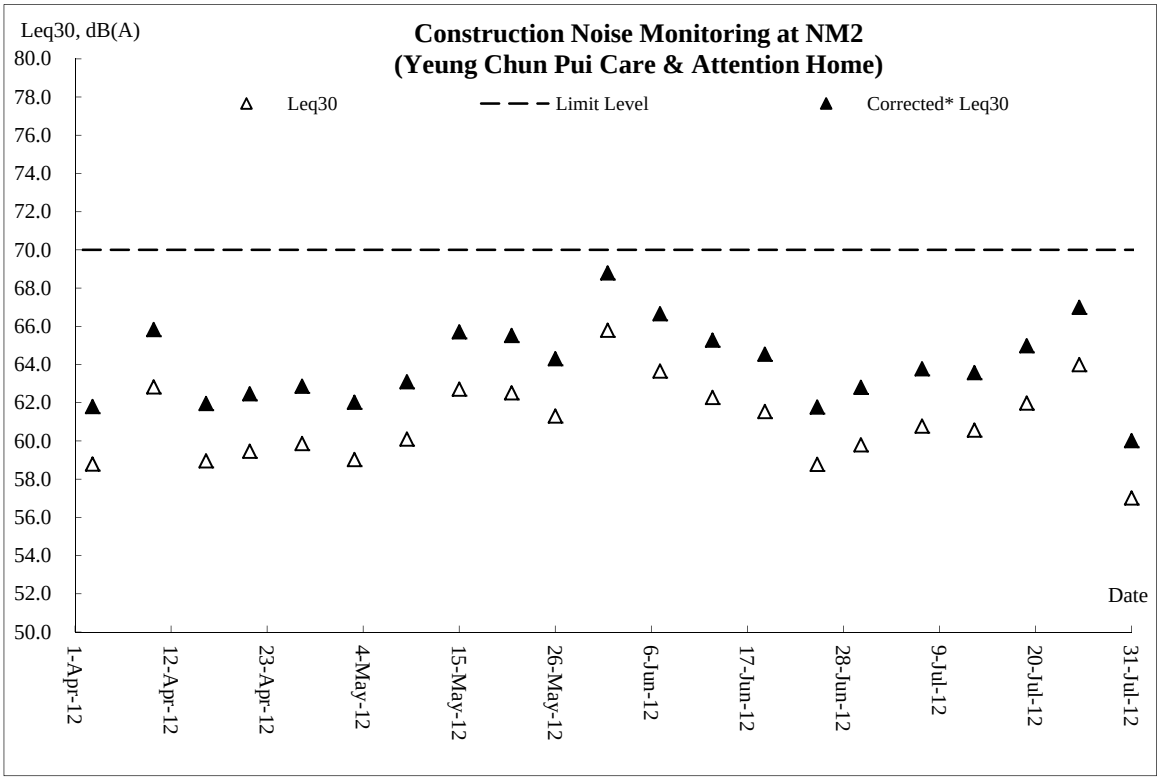
Air Quality – 24-hour TSP



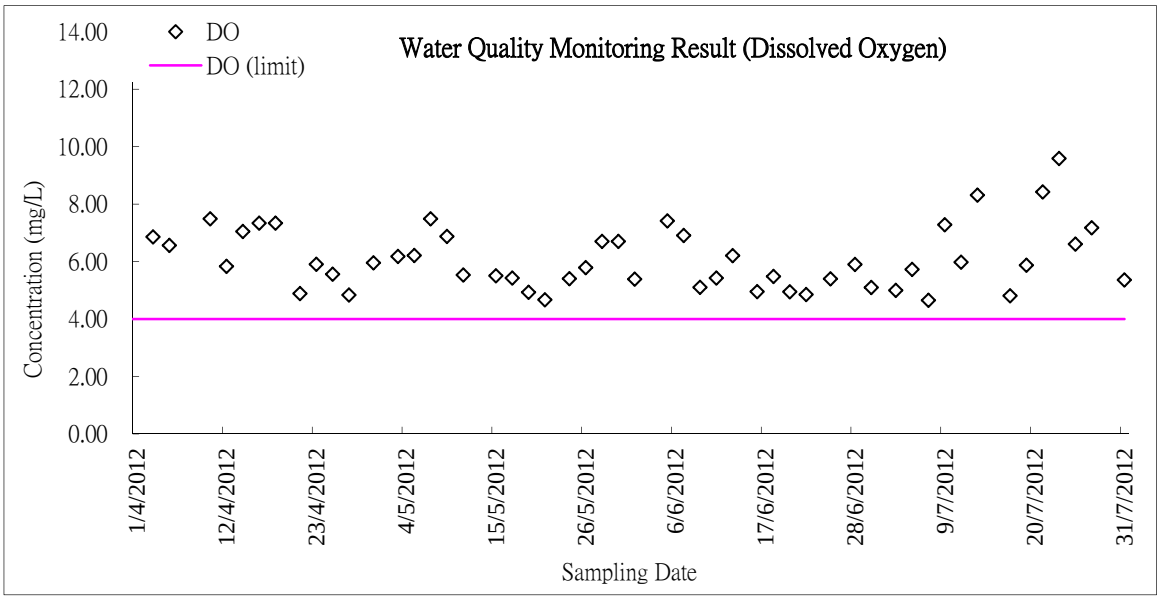


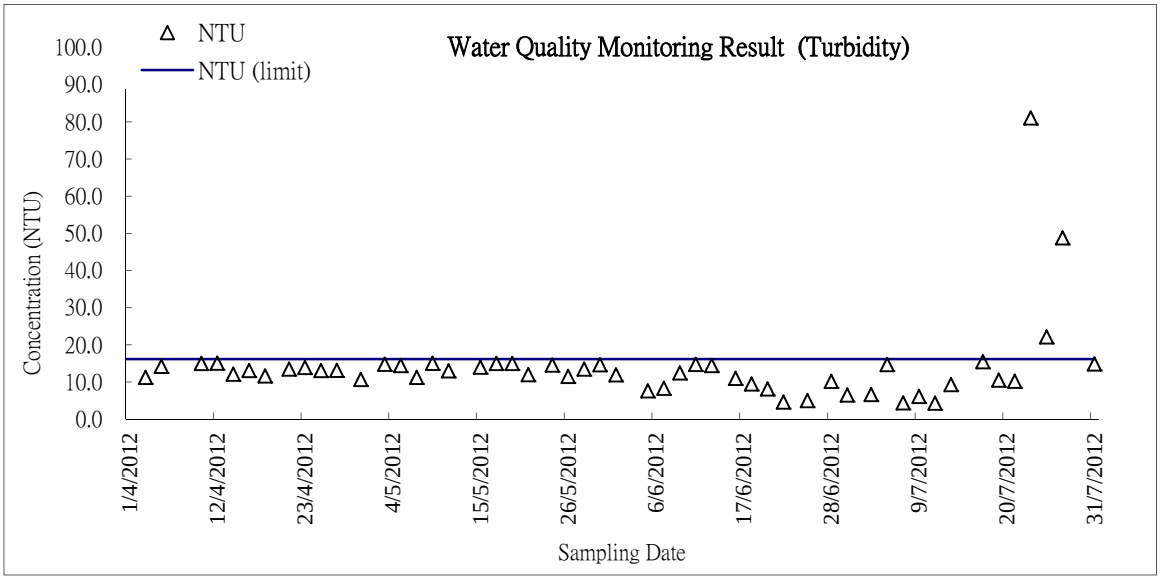
Construction Noise

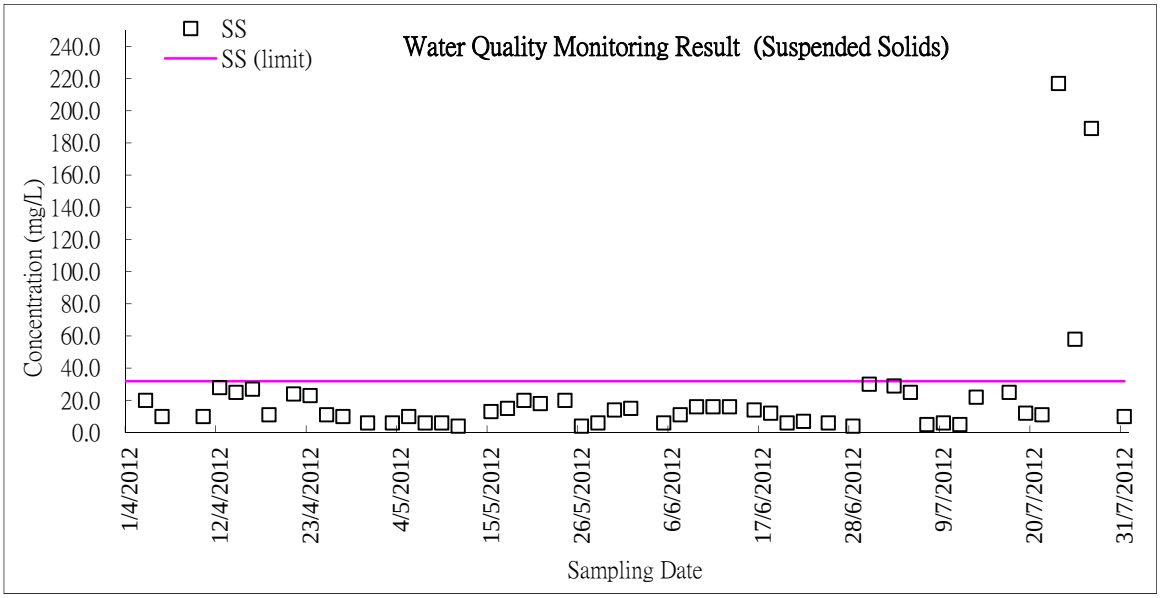




Water Quality (R1b)







Appendix F

Meteorological information

Meteorological Data Extracted from HKO – May 2012

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-May-12	Tue	holiday					
2-May-12	Wed	Mainly fine and hot.	0.4	30	20.7	76	S/SW
3-May-12	Thu	Sunny intervals with a few showers.	Trace	29.4	16	78.7	S/SE
4-May-12	Fri	Moderate east to southeasterly winds.	35.7	28.3	12.6	79.2	S/SE
5-May-12	Sat	Light to moderate southwesterly winds.	3.4	26.3	13	82	SE
6-May-12	Sun	Mainly fine and hot.	0	27	11	80	SE
7-May-12	Mon	Moderate east to southeasterly winds.	0	27.5	11.5	77.5	E/NE
8-May-12	Tue	Mainly fine and hot.	0	29.5	9.4	75	S
9-May-12	Wed	Sunny intervals with a few showers.	0	29.9	16.1	76.5	SW
10-May-12	Thu	Moderate southerly winds.	6.1	29.1	16.7	78	S/SW
11-May-12	Fri	Moderate east to southeasterly winds.	1.4	27.7	14.5	81.5	E
12-May-12	Sat	Light to moderate easterly winds.	0.1	28.1	7.5	81	S/SW
13-May-12	Sun	Isolated thunderstorms	4.6	28.4	16	76	S/SW
14-May-12	Mon	Moderate southerly winds.	1.9	28.5	12.9	82.5	SE
15-May-12	Tue	Sunny intervals tomorrow with a few thunderstorms.	22.1	28.5	9.7	84	SE
16-May-12	Wed	Cloudy with showers.	14.4	28.1	10.6	81.5	E/NE
17-May-12	Thu	Cloudy with scattered showers and a few isolated thunderstorms.	2	28.1	8.1	82.7	E/NE
18-May-12	Fri	Cloudy with occasional rain and a few squally thunderstorms.	83.8	26.1	15	89.5	E/SE
19-May-12	Sat	Mainly fine.	7.4	27.7	7.4	85	E/NE
20-May-12	Sun	Fresh easterly winds	49.6	28.8	16	81	E/NE
21-May-12	Mon	occasionally strong offshore	Trace	27.3	15.7	75.5	E/NE
22-May-12	Tue	Moderate to fresh easterly winds.	Trace	26.6	18.7	65	E
23-May-12	Wed	Moderate east to southeasterly winds.	0	27.2	16	66.5	E/NE
24-May-12	Thu	Moderate southerly winds.	Trace	28.2	12.2	69	E/NE
25-May-12	Fri	Mainly fine.	Trace	28.9	14.7	75.5	E/NE
26-May-12	Sat	Cloudy with showers.	28.4	27.7	12.4	71	E/NE
27-May-12	Sun	Moderate to fresh easterly winds.	5.8	28.8	13.3	79.5	NE
28-May-12	Mon	Fresh easterly winds	10.5	27.8	15.3	82.5	E/NE
29-May-12	Tue	Cloudy with one or two rain patches	0.1	27.4	18.9	77.5	E
30-May-12	Wed	Fresh easterly winds, occasionally strong offshore.	Trace	28.9	12	90.5	E/NE
31-May-12	Thu	Mainly cloudy.	Trace	28.7	16	78.5	E/NE

Meteorological Data Extracted from HKO – June 2012

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Jun-12	Fri	Fresh southwesterly winds	0	27.3	21.5	65.7	E/NE
2-Jun-12	Sat	Mainly fine and hot	8.6	27.9	19.5	72	E/NE
3-Jun-12	Sun	Moderate east to southeasterly winds.	Trace	27.8	10.1	78.5	E/NE
4-Jun-12	Mon	Mainly fine and hot	Trace	28.3	8.4	74.2	E/SE
5-Jun-12	Tue	Mainly fine	0	28.5	13.7	74.2	E/SE
6-Jun-12	Wed	Fresh southwesterly winds	0	29.5	12.1	70.7	S/SE
7-Jun-12	Thu	Mainly fine and hot	Trace	30	12.2	73.7	E/NE
8-Jun-12	Fri	Fresh southwesterly winds	0	30.2	11.5	75.5	S/SE
9-Jun-12	Sat	Moderate west to northwesterly winds.	1.5	30	17.3	84	S/SW
10-Jun-12	Sun	Fresh southwesterly winds	26.8	29.6	23.7	82.5	S/SW
11-Jun-12	Mon	Mainly cloudy with scattered showers	0.2	29.3	21.7	83.2	S/SW
12-Jun-12	Tue	Mainly cloudy with a few showers.	2.8	29.4	17.7	75.2	W/SW
13-Jun-12	Wed	Mainly fine	22.5	26.9	14.5	88	N/NW
14-Jun-12	Thu	Very hot in the afternoon.	Trace	Maintenance	14	Maintenance	E/NE
15-Jun-12	Fri	Light to moderate southeasterly winds.	Trace	Maintenance	12	Maintenance	E/NE
16-Jun-12	Sat	Mainly fine and hot	60.3	26.7	14	81.7	E/NE
17-Jun-12	Sun	Moderate east to southeasterly winds.	24.6	27.8	16.5	85.5	E/NE
18-Jun-12	Mon	Mainly fine.	17.7	27.4	13.5	86	E/NE
19-Jun-12	Tue	Very hot in the afternoon.	1.4	28.5	13	82	E/NE
20-Jun-12	Wed	Moderate east to southeasterly winds.	0	30.7	13.1	73.5	SW
21-Jun-12	Thu	Cloudy with scattered showers	31.2	27.1	12.9	91.5	S/SE
22-Jun-12	Fri	Light to moderate southeasterly winds.	16	27.5	21.7	86.2	S
23-Jun-12	Sat	HOLIDAY					
24-Jun-12	Sun	Very hot	4.9	Maintenance	Maintenance	Maintenance	Maintenance
25-Jun-12	Mon	isolated showers.	0.2	28.5	20.5	80.7	S
26-Jun-12	Tue	Moderate west to northwesterly winds.	0.8	29.1	18	79.5	S/SE
27-Jun-12	Wed	Very hot in the afternoon.	Trace	27.7	19	77.5	S/SE
28-Jun-12	Thu	Mainly fine and hot	0	30.3	15.7	71	SE
29-Jun-12	Fri	Tropical Storm	3.9	29.8	19.7	74.5	W/SW
30-Jun-12	Sat	Tropical Storm	38.1	27.4	21.2	81	W/SW

Meteorological Data Extracted from HKO – July 2012

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Jul-12	Sun	HOLIDAY					
2-Jul-12	Mon	HOLIDAY					
3-Jul-12	Tue	Moderate southwesterly winds.	0	28.2	12.7	79.2	W/SW
4-Jul-12	Wed	Mainly fine.	0	29.9	7.5	73	E/SE
5-Jul-12	Thu	Very hot in the afternoon.	22	28.1	7.8	81.5	E/SE
6-Jul-12	Fri	Moderate south to southwesterly winds.	0.8	29.2	12.3	78.5	SE
7-Jul-12	Sat	Very hot during the day	2.7	29.3	7.5	70.7	S/SE
8-Jul-12	Sun	Mainly fine.	0.4	29.1	17.5	84.7	S/SE
9-Jul-12	Mon	Mainly fine and very hot	Trace	29.3	12.5	78.5	W/SW
10-Jul-12	Tue	Fine and very hot apart from one or two isolated showers at first.	Trace	30.1	17	76	W/SW
11-Jul-12	Wed	Very hot in the afternoon.	Trace	30.5	15.3	74.7	S/SW
12-Jul-12	Thu	Mainly cloudy with a few showers.	1.3	30.6	15.6	69	SW
13-Jul-12	Fri	Hot with sunny intervals	9	30	17.3	75.5	S/SW
14-Jul-12	Sat	Moderate southwesterly winds, fresh offshore.	7	Maintenance	Maintenance	Maintenance	Maintenance
15-Jul-12	Sun	Mainly fine and very hot.	2.1	Maintenance	Maintenance	Maintenance	Maintenance
16-Jul-12	Mon	Mainly fine and very hot.	18.1	Maintenance	Maintenance	Maintenance	Maintenance
17-Jul-12	Tue	Moderate south to southwesterly winds.	1	Maintenance	Maintenance	Maintenance	Maintenance
18-Jul-12	Wed	Sunny periods in the afternoon.	34.3	28.3	12.6	81.5	SE
19-Jul-12	Thu	Mainly cloudy with a few showers.	Trace	30.7	11	74	W/SW
20-Jul-12	Fri	Mainly fine and very hot.	4.2	30.6	13.6	73	W/SW
21-Jul-12	Sat	The Strong Wind Signal, No. 1	2.2	31.1	17.5	74	E/NE
22-Jul-12	Sun	The Strong Wind Signal, No. 1	1	29.4	20.2	78.7	E/NE
23-Jul-12	Mon	The Strong Wind Signal, No. 3	112	26.3	25	86.5	N/NE
24-Jul-12	Tue	The Strong Wind Signal, No. 3	99.5	27.5	40	89.7	Maintenance
25-Jul-12	Wed	Moderate east to southeasterly winds.	82.3	25.8	18.2	91.5	Maintenance
26-Jul-12	Thu	Cloudy with scattered showers and a few squally thunderstorms.	28.1	25.7	7.5	92.5	Maintenance
27-Jul-12	Fri	Light winds.	25.7	25.3	9.7	93.5	Maintenance
28-Jul-12	Sat	Light winds.	Trace	28.6	11.5	80	W/SW
29-Jul-12	Sun	Isolated showers in the afternoon	0	28.3	10.7	76	W/SW
30-Jul-12	Mon	fine and very hot.	0	29.3	9	69.5	SW
31-Jul-12	Tue	Amber Rainstorm Warning Signal	9.5	25.8	13.7	75.5	SW